

STUDIES IN THE GENUS COCCOLOBA, IX.
A CRITIQUE OF THE SOUTH AMERICAN SPECIES

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THE FIRST SIX PAPERS of this series treated the West Indian species of the polygonaceous genus *Coccoloba*, with the work based largely upon field studies in this area. The seventh paper dealt with the species of Central America and Mexico; the writer has only a slight knowledge of these species in the field, but fortunately had available an unusually large number of collections as well as extensive field notes made by recent collectors. This paper will treat the species of South America. The limitations of this study are greater both from lack of field knowledge and the fewer specimens available. For these reasons, this treatment is probably more conservative than future workers will deem necessary. The goals of this study have been 1) to bring together all records of taxa of *Coccoloba* for South America; 2) to correct existing errors of literature citation; 3) to evaluate and compare published species where possible; 4) to locate the existing type collections; and 5) to select lectotypes of many species. It is hoped that these notes will encourage collectors and botanists in the area to gather complete material of the species and to record adequately the variations so as to allow a better understanding of certain morphological problems. Only then can the monographer prepare complete descriptions and keys for the species in South America.

The earliest comprehensive treatment of the species of *Coccoloba* in South America was prepared by Meisner for the *Flora Brasiliensis* (5(1): 23–44. 1855). Although some species were illustrated, the descriptions in general were inadequate and no keys were given. Specimens cited previously from the Martius herbarium have since been found in Brussels, Munich, and Leningrad, and a few numbers have been widely scattered. Representative specimens of several species attributed to Martius could not be located for this study and in some other species the selection of a lectotype has required very careful comparisons between specimens from several herbaria and published descriptions.

In 1856 Meisner provided a synopsis of the genus for DeCandolle's *Prodromus* (14: 150–171). One might expect that many of the specimens which Meisner cited would be in the *Prodromus* herbarium or in the Delessert herbarium at Geneva, but, unfortunately, very few are represented in either collection. Meisner's personal herbarium, which has been acquired by the New York Botanical Garden, includes specimens of most species of *Coccoloba*. A few of these are small fragments, yet they represent the only existing type material for certain species.

The only complete monograph of *Coccoloba* was prepared by Lindau

and published in 1890 in Engler's *Botanischer Jahrbücher* (13: 106–229). Many adjustments are necessary therefore to bring the specific names into conformity with the present rules of nomenclature. Lindau's descriptions are not models of accuracy, and the key published in the monograph contains so many errors of fact that it is almost unusable. Following the description of a plant, Lindau cited the collector's name and collection number and at the end gave a list of the herbaria in which he had seen the material. In the selection of a lectotype, therefore, it has been necessary to associate the collection with a particular herbarium. The information supplied in this paper should make easier the work of the next monographer who wishes to obtain material for study.

Lindau frequently cited specimens to be found only in the Berlin herbarium. A study of these, annotated by Lindau, has shown them to be fragments of specimens from other herbaria. There is a question whether the holotype is really the Berlin fragment and only specimen the author cited, or the more ample specimen in some distant herbarium which the author may not have seen and did not annotate.

The specimens of *Coccoloba* in the Vienna herbarium were lost or destroyed during World War II. According to Lindau's citations some of the Jacquin material was at Vienna and is no longer available. A very few of the Vienna specimens were photographed before 1940, and prints of these in the herbarium of the Chicago Natural History Museum are the basis for discussion of these names here.

Most existing treatments of the genus have assumed the flowers to be perfect. During field study of the species in the West Indies the author determined that the flowers are functionally unisexual and that the plants are dioecious. Recently Buchinger and Sanchez examined the species found in Argentina and concluded (Bol. Soc. Argent. Bot. 7: 251–255. 1959) that one species of *Coccoloba* in that country is truly dioecious, but that the remainder have perfect flowers or are monoecious. Very few collections are cited in their work and none of those was available to me. I have examined many specimens which I assign to these same species from Argentina and find no evidence in the herbarium specimens to support their conclusions. In the specimens which I examined the flowers with conspicuous pistils have small or rudimentary stamens which do not produce pollen. Flowers with large stamens which produce pollen appear to have undeveloped or rudimentary pistils. There were no specimens with pollen-producing flowers and fruits on the same branches. I do not doubt their decision, since it was based on field study of carefully selected material, but I do point out the difficulty of stating definitely the sexual condition in herbarium specimens and the futility of using in a key such contrasting characteristics as plants monoecious or plants dioecious.

The species in the West Indies were studied in the field to determine leaf variation. I found that vigorous terminal shoots, short branches, branches of average growth, and adventitious shoots might all have different sizes and shapes of leaves. This leads one to question Lindau's

descriptions and keys, since he seems to have relied much on the size and shape of leaves and particularly on the shape of the leaf base.

The habit of the plant also was found to be variable in West Indian species. Some are shrubby or tree-like at the base, but with scrambling branches having the appearance of lianas. Thus herbarium specimens consisting of flowering or fruiting branches without adequate habit notes may not be indicative of the true character of the species.

Relatively few of the South American species considered in the following notes are represented by both flowers and fruit. In some cases it has been possible to associate as one taxon certain flowering and fruiting specimens originally described as separate species. When peculiarities of growth can be properly associated with flowering and fruiting specimens additional species will undoubtedly be combined. Throughout the following text I have been conservative in maintaining as distinct species all specimens concerning which there may be some question. When further evidence becomes available, many of these species may be united.

I have been fortunate to have on loan for study the important historical collections of *Coccoloba* from the Botanisches Museum, Berlin, which formed the basis for Lindau's work; the Jardin Botanique de l'État, Brussels, which include many Martius collections; the Botanische Staatssammlung, Munich, also rich in Martius material; the New York Botanical Garden which include recent collections, as well as Meisner's personal herbarium; and the Herbarium of the Department of Systematics and Plant Geography of the Botanical Institute of the Academy of Sciences of the U.S.S.R., Leningrad, which contains so many duplicates of classic collections. I am most grateful to the directors and curators of these institutions for making their collections available for an unusually long period of time. Selected collections have been borrowed from other institutions and I have visited still more herbaria for study. The many courtesies which made this publication possible are much appreciated. The standard abbreviations of Index Herbariorum have been used in this paper.

Species of *Coccoloba* have been reported from every country in South America, with the sole exception of Chile. In the citation of specimens the countries and their subdivisions, as well as the specific localities of collections, are listed in alphabetical order.

Coccoloba acrostichoides Chamisso, *Linnaea* 8: 132–133. 1833; Meisner, *Fl. Bras.* 5(1): 33. *pl.* 13, *fig.* 2. 1855; Lindau, *Bot. Jahrb.* 13: 138. 1890.

Coccoloba rubiginosa Martius ex Meisner, *Fl. Bras.* 5(1): 33. 1855, in syn.

Chamisso did not cite a specimen in the original description, and previous monographers have not indicated a type. There is a specimen in the Leningrad herbarium collected by Sellow and bearing on the label the name "*Coccoloba acrostichoides* N" and the annotation "Hb. Cham." This specimen is probably authentic. A more ample specimen in the Berlin herbarium has a tag which bears the number "1393" attached but lacks

the reference to the Chamisso herbarium. Lindau did not see or cite either of these collections, yet one must be considered the lectotype and I so designate the specimen at Berlin. All other Sellow collections, including those cited by Lindau, are annotated "*Coccoloba acrostichoides* Cham. et Schl."

The illustration in *Flora Brasiliensis* well represents this species. A printer's proof of this drawing is in the Brussels herbarium and the specimen *Claussen 330* is mounted on the same sheet. There is little similarity between the two, and the illustration appears to be a compilation.

Coccoloba acrostichoides is one of the most distinctive species of the genus, with copious dark-brown pubescence on the lower leaf surface. In leaf shape and in the nature of the inflorescence it is similar to *C. brasiliensis*. The species is not known in fruit and I have not seen any collections more recent than those of Glaziou.

Coccoloba rubiginosa Martius ex Meisner was published in synonymy and has no validity. A specimen at Munich from the Martius herbarium bears this name, but no location or collector is indicated.

Brazil. MINAS GERAIS: Ouro Preto, *Glaziou 15356* (BR, LE); without specific location, *Claussen 330* (BR). RIO DE JANEIRO: San Antonio, *Sellow "B 1393. c 429"* (B). LOCATION NOT KNOWN: Herb. *Martius s.n.* (M-type of *C. rubiginosa*), *Sellow 1251* (B), *1393* (B-lectotype; LE).

Coccoloba acuminata HBK. Nov. Gen. 2: 176. 1817.

Coccoloba acuminata var. *pubescens* Lindau, Bot. Jahrb. 13: 193. 1890.

Coccoloba acuminata var. *glabra* Lindau, *ibid.* 194.

Coccoloba strobilulifera Meisner, Fl. Bras. 5(1): 25. 1855.

I discussed this species in an earlier paper (Jour. Arnold Arb. 40: 185. 1959) when I concluded that the amount of pubescence on the plant varied with the age and the vigor of the specimen. I cannot find any value or significance in the two varieties Lindau published.

A specimen from the Brazilian state of Pará, *Huber 4393*, bears an unpublished herbarium name attributed to Huber. The specimen is clearly referable to synonymy here.

A collection in the herbarium of the University of Wisconsin numbered "45" but without collector was supposedly made in La Lima, Chile. The authenticity is to be questioned as the specimen compares favorably with material from Colombia and Peru.

In addition to the specimens cited below, I have seen material from Guatemala, Honduras, Nicaragua, Costa Rica and Panama (Howard, *loc. cit.*).

Brazil. ACRE: Rio Macauhan, *Krukoff 5666* (A, LE, M, NY). AMAZONAS: Rio Embira, *Krukoff 4715* (A, LE, M, NY); Yuruá Miry, *Ule 5723* (B). PARÁ: Pará, Alto Purus, Ponto Alegre, *Huber 4393* (F, U). **British Guiana.** Courantyne, *Schomburgk 1600* (B). **Colombia.** ANTIOQUIA: Río Magdalena, Brazuela de Perales, *Pennell 3699* (GH). BOLÍVAR: San Martín de Loba, *Curran 40* (GH), *100* (Y), *211* (Y). MAGDALENA: Río Magdalena near Mompós, *Humboldt 1479*

(Herb. Willd.—type of *C. acuminata*); Río Sevilla, *Record* 9 (A, GH, Y). SANTANDER: Río Magdalena, *Kalbreyer* 1280 (B). LOCALITY NOT SPECIFIED: *Goudot* 3 (B), *Moritz* s.n. (BR, LE, P—type of *C. strobilulifera* and *C. acuminata* var. *glabra*), *Triana* s.n. (B). Ecuador. Balao, *Eggers* 14239 (A, BR, LE, M). Peru. LORETO: lower Río Huallaga, *Llewelyn Williams* 4804 (A). Venezuela. YARACUY: Los Cañizos, plains of Yaracuy River, *Pittier* 8753 (GH). ZULIA: Perija, *Tejera* 253 (GH), *Mocquerys* 845 (P).

***Coccoloba alagoensis* Weddell, Ann. Sci. Nat. III. 13: 260. 1850.**

Weddell based this species on *Gardner* 1389 from the state of Alagoas, Brazil. At present I am unable to determine the relationship of this species to *Coccoloba obtusifolia* Jacq. and *C. peruviana* Lindau. A full discussion will be found under *C. obtusifolia*.

***Coccoloba alnifolia* Casaretto, Nov. Stirp. Bras. 71. 1844.**

Coccoloba populifolia Weddell, Ann. Sci. Nat. III. 13: 257. 1850; Meisner, Fl. Bras. 5(1): 40, pl. 18. 1855; Lindau, Bot. Jahrb. 13: 198. 1899.

Lindau accepted the Weddell name for this species, although he cited in synonymy the epithet Casaretto published several years earlier. Casaretto did not cite a specimen in the original publication, but it seems clear to me that the description and data given are based on his collection numbered 1194. This collection consists of two sheets in the Turino herbarium and I have designated one of them as the lectotype.

There is a possibility that the older epithet *Coccoloba firma* Martius ex Colla (1836) is the correct one for this species. The current difficulty in determining the type of *C. firma* will be discussed under that name.

Brazil. BAHIA: *Blanchet* 1486 (c, g—type collection of *C. populifolia*); *Sellow* 1137 (B), 793 (B). PERNAMBUCO: *Tapera*, *Pickel* 3681 (GH, NY). RIO DE JANEIRO: Tijuca, *Lützelburg* 343 (M); without specific locality, *Casaretto* 1270 (TO), *Gaudichaud* 420 (B, G, P), *Luschnath* 835 (LE), s.n. (M), *Martius* s.n. (M), *Riedel* 7 (BR, LE), 673 (LE, M), *Widgren* 719 (BR). STATE NOT SPECIFIED: Copacabana, *Casaretto* 1194 (to-lectotype of *C. alnifolia*), *Nadeaud* s.n. (P). CULTIVATED: São Paulo Botanical Garden, *Hoehne* 28527 (A).

***Coccoloba arborescens* (Vellozo) Howard, Jour. Arnold Arb. 41: 44. 1960.**

Polygonum arborescens Vellozo, Flor. Flum. 162. 1825, Icones 4: t. 43. 1827. *Coccoloba crescentiifolia* Chamisso, Linnaea 8: 134. 1833, “*crescentiaefolia*.” *Coccoloba vellosiana* Casaretto, Nov. Stirp. Bras. 70. 1844. *Coccoloba fasciculata* Weddell, Ann. Sci. Nat. III. 13: 258. 1849. *Coccoloba crescentiifolia* var. *obtusata* Meisner, Fl. Bras. 5(1): 26. 1855.

The previous paper in this series (Howard, *loc. cit.*) contains a discussion of the nomenclature of this species. For the present, the type is considered to be the Vellozo illustration. After a careful study of this species in the field it may be desirable for some future monographer to select a modern specimen as neotype.

Brazil. BAHIA: *Blanchet* 796 (F, NY, P-type of *C. fasciculata*). RIO DE JANEIRO: Praya Grande, *Sellow* s.n. (B, LE, M-type collection of *C. crescentiifolia*); *Glaziou* 143 (BR); *Riedel* 674 (A, BR, P). STA. CATARINA: Hooker Herb. without collector or number (K). STATE NOT SPECIFIED: Copacabana, *Luschnath* s.n. (BR); between San Juan and Rio dos Oistres, *Prince Maxim. Neuwied* s.n. (BR, NY). LOCALITY NOT SPECIFIED: *Claussen* 2013 (G, NY-type collection of *C. crescentiifolia* var. *obtusata*).

Coccoloba argentinensis Spegazzini, *Physis* 3: 176. 1917; Buchinger and Sanchez, *Bol. Soc. Argent. Bot.* 7: 251. 1959.

Coccoloba praecox Herter, *Rev. Sudam. Bot. Montevideo* 10: 38. 1952.

Spegazzini failed to select a type in the original description. He referred to material collected by M. Rigou in 1902 from the station "Margherita," Prov. Santa Fe, and to material collected the following year in Reconquista. Correspondence with several Argentine botanists indicates that the Spegazzini herbarium has been neglected in the past and that some material has been lost. Dr. Maria Buchinger reported that she saw the "type" several years ago but currently there are no specimens of the species in the herbarium of Spegazzini at La Plata and no other herbarium contains such material. As long as there is a possibility that the original material may be located, a neotype should not be selected. In their recent paper Buchinger and Sanchez cite only one collection, *Schulz* 240, which I have not seen. They further consider the species to be endemic to the Chaco territory and to be found only in the provinces of Salta and Chaco, thereby eliminating the locality of the type collection.

The material cited below appears to me to correspond with the original description. *Coccoloba argentinensis* is easily recognized by the small obovate-elliptic leaves, the long fruiting pedicels, and the flowering of the plant before the leaves are fully developed.

Coccoloba praecox Herter was distinguished on these same characteristics but without comparison with the present species. I have examined an isotype and conclude that the reduction of *C. praecox* to the synonymy of *C. argentinensis* is necessary. *Coccoloba praecox* Herter is also a later homonym of *C. praecox* Wright ex Lindau (*Bot. Jahrb.* 13: 142. 1890).

Argentina. CHACO: Fontana, *Meyer* 2517 (F); Las Palmas, *Jorgensen* 2103 (GH, US), 2106 (GH); Resistencia, Colonia Benítez, *Petersen* 3986 (A). JUJUY: Este Hacienda, s. of Jujuy, *Eyerdam & Beetle* 22432 (GH). SALTA: Orán, Manuela Pedraza, *Eyerdam & Beetle* 22647, 22790 (G, GH); Pichanal, *Rodriguez* 1121 (GH, NY); Rosario de la Frontera, Los Baños, *Venturi* 9402 (GH). TUCUMÁN: Capital, Barranca Colorada, *Venturi* 955 (GH), *Schreiter* 1516 (GH); Trancas, Tapia a Roca, *Schreiter* (*Herb. Lillo* 84971 (US), Vipos, *Venturi* 9792 (A, GH, LE). Uruguay. Salto, Arapey, *Herter* (*Herb. Herter* 50852-type collection of *C. praecox*; F, P); Isla Gaspar, *Berro* 3334 (G).

Coccoloba ascendens Duss ex Lindau, *Bot. Jahrb.* 13: 156. 1890.

In a previous discussion of this species (*Jour. Arnold Arb.* 40: 72, 73. 1959), I selected a specimen from Martinique, *Hahn* 1005, in the Berlin

herbarium as the lectotype. The species is well represented in the Lesser Antilles from Guadeloupe south to Trinidad. Lindau (Bot. Jahrb. 13: 156. 1890) cited specimens only from Guadeloupe, Martinique and Brazil. Eyma (Meded. Bot. Mus. Utrecht 4: 110. 1932) mentioned the distribution of the species as "Guyana, Brazil, Guadeloupe, Martinique." I have seen neither the specimens cited from the Guianas (*B.W.* 6560, 6600, and possibly *B.W.* 6490 and 6550*b*) nor those Lindau cited from the states of Pará and Goyaz in Brazil (*Burchell* 8034, 9345 and *Gardner* 3966). On the basis of an unnatural range I question particularly the Brazilian determinations given by Lindau. Future workers with additional material at their disposal doubtless will check the relationship of *Coccoloba ascendens* and *C. sparsifolia*.

***Coccoloba barbeyana* Lindau, Bot. Jahrb. 13: 185. 1890.**

I have examined the single collection cited by Lindau (*Ruiz & Pavon s.n.*, Peru, without definite locality, in the Barbey-Boissier herbarium) and failed to find the holotype or the species distinct in any way from *Coccoloba densifrons* Martius ex Meisner. Although Lindau accepted *C. densifrons* (based on a Martius collection from Ega in the Brazilian Amazon) he did not list the epithet in the key to the species.

***Coccoloba billbergii* Lindau, Bot. Jahrb. 13: 219. 1890.**

Lindau cited "*Coccoloba obtusifolia* Meissn. (non Jacq.)" in synonymy when he described *C. billbergii* based on *Billberg* 204 and 204*a* from Carthagera, implying that Meisner was in error. However, Meisner noted both the similarity of these Billberg collections to *C. obtusifolia*, as described and illustrated by Jacquin, and the discrepancy in the specimens so labeled in the Willdenow herbarium and the reference in the Willdenow catalogue. Lindau chose to interpret *C. obtusifolia* on the basis of the specimen in the Willdenow herbarium and incorrectly to consider *C. obtusifolia* as a species from the West Indies. I have examined the Billberg collections cited by Lindau from the Berlin and Stockholm herbaria. These are correctly associated with *C. obtusifolia* Jacq. as a South American species. *Coccoloba billbergii* Lindau must be considered a synonym of *C. obtusifolia* Jacq.

"*Coccoloba obtusifolia*" as used by Lindau (*loc. cit.* 146, 147) is correctly assigned to synonymy under *C. microstachya* Willd. (Howard, Jour. Arnold Arb. 38: 217-219. 1957).

***Coccoloba blanchetiana* Weddell, Ann. Sci. Nat. III. 13: 257. 1850.**

Weddell cited *Blanchet* 3561, from near Jacobina, Bahia, Brazil (G, P). This species is to be referred to the synonymy of *C. ochreolata* Weddell and will be discussed there.

Coccoloba bolivarana Llewelyn Williams, Trop. Woods 68: 39. 1941.

In a list of the forest trees of Venezuela, Williams refers to "Brusquillo Blanco, *Coccoloba bolivarana* (a new species), a tree about 8 m. high, growing in rocky areas, with a trunk ramified from the base, and bearing a juicy, lustrous black fruit." The species has not been published validly with a Latin description, to my knowledge, and the brief description given above is scarcely to be considered diagnostic in this difficult genus. Specimens in the herbaria of the Chicago Natural History Museum and the Royal Botanic Gardens, Kew, bear this name but attribute it to Standley. The specimens (*Williams 13374*) were collected at El Tigre, Los Garzones, on Río Cuchivero, Bolivar, Venezuela. They cannot be assigned to any recognized species and will be described in a later paper.

Coccoloba bracteolosa Meisner, Fl. Bras. 5(1): 30. 1855.

No type was selected in the original description, but a Martius collection without number from Joazeiro, on the Rio San Francisco, in Bahia, Brazil, has been photographed by other workers in the Munich herbarium and distributed as the type. I am referring this species to the synonymy of *Coccoloba ochreolata* Weddell and will discuss the problem under that name.

Coccoloba brasiliensis Nees & Martius, Nov. Act. Acad. Nat. Cur. 11: 30. 1823; Meisner, Fl. Bras. 5(1): 32. *t.* 13, *f.* 1. 1855.

Coccoloba senaei Lindau ex Glaziov, Bull. Soc. Bot. France 58: 571. 1911.

The original description cites first the locality of "X Valos" and then a general littoral distribution in Bahia, "Maragnanum" and Para, the latter attributed to Martius. I have seen no Martius specimens which fit the original description among the material from the Martius herbarium now at Brussels, Leningrad, or Munich. In his treatment of the genus for *Flora Brasiliensis*, Meisner redescribed the species and cited collections by Prince Maximilian and Martius. The illustration in *Flora Brasiliensis* is based on the specimen collected by Prince Maximilian and I select this as the lectotype.

A previous worker, possibly Meisner, has annotated some sheets to indicate a similarity to or a relationship with *Coccoloba rigida* Meisner. (Lindau, not following the homonym rule, accepted *C. parvifolia* Schott 1827, not Poiret 1804, and included in synonymy *C. rigida* Meisner.) Lindau distinguished between *C. brasiliensis* and "*C. parvifolia*" on the puberulent inflorescence axis in the latter species and the glabrous one in *C. brasiliensis*. An examination of the specimens cited below will show that the stem, ocreae, petioles, and frequently the base of the leaf blade are puberulent to short pilose in *C. brasiliensis*. The bracts and ocreolae of the inflorescence are likewise slightly puberulent to glabrous. On the characteristic of pubescence there is scant reason for separating *C. brasi-*

liensis and "*C. parvifolia*." However, the leaves of *C. brasiliensis* are variable in size and shape. In the type, and in the most recent collections, the leaves are thicker in texture and the bases are rounded-cordate, in contrast to those of "*C. parvifolia*." The inflorescence of the type is as compact as that of "*C. parvifolia*" but recent collections show longer, more lax inflorescences in which the ocreolae do not expand with the developing flower buds, and are, in fact, shorter than the bracts in all stages of development. Until these characteristics can be evaluated by field studies it seems desirable to retain *C. brasiliensis* as a species distinct from *C. rigida*.

The several sheets of the collections by Glaziou cited below suggest that the existing descriptions of *Coccoloba brasiliensis* are unsatisfactory and must be changed to accommodate the narrow, lanceolate-oblong leaves of the vigorous shoots and the large, oblong, but sessile, leaves of adventitious shoots. The Glaziou collection without number in the Paris herbarium has some leaves with blades 18 cm. long and 9 cm. wide. The largest leaf on the lectotype is 4 cm. long and 2.3 cm. wide, yet the collections cited below show all intermediates between these extremes.

The phrase "*Coccoloba senaei* Lindau n. sp." is used by Glaziou in a list of determinations of his collections. The brief description "Arbuste sarmenteux, fl. blanchâtres" can scarcely be considered diagnostic in this genus and I consider *C. senaei* to be a *nomen nudum*.

Brazil. MATO GROSSO: Barao de Capanema, Rio Cravary, *Baldwin* 3129 (US). MINAS GERAIS: Conselheiro Mata, *Brade* 13815 (B), 13816 (B); "in deserto Minarum," *Martius* s.n. (M); Rio dos Pedras, Valu, *Glaziou* 19762 (B, LE), 19763 (B, K, LE); Serra do Cipó, *Schwacke* 8005 (B), *Brade* 14841 (B). WITHOUT SPECIFIC LOCALITY: Valos, *Prince Maximilian* 88 (B, BR-lectotype; LE); *Glaziou* s.n. (P).

Coccoloba brasiliensis Sprengel, Syst. Veg. 2: 252. 1825.

This epithet is a later homonym of *Coccoloba brasiliensis* Nees & Martius. The species was based on a Sellow collection from Brazil which I have not seen. The description is not that of a species of *Coccoloba*. It was referred to the genus *Hedyosmum* of the Chloranthaceae by Chamisso (*Linnaea* 4: 36. 1833). I have not determined whether this is the same as *Hedyosmum brasiliense* Mart., recognized by Occhioni in his recent monograph of the genus (*Contribuição ao estudo de família Chloranthaceae com especial referencia ao gênero Hedyosmum* Sw. Rio de Janeiro, 1954).

Coccoloba candolleana Meisner, Fl. Bras. 5(1): 41. 1855.

Meisner based this species on the collection *Blanchet* 1818 from Bahia, Brazil. He noted its similarity to *Coccoloba cordata* Chamisso. I am unable to distinguish the two and so refer *C. candolleana* to the synonymy of the older name, *C. cordata*.

Lindau (*Bot. Jahrb.* 13: 201. 1890) cited *Goudot* 4, from Colombia, in

his treatment of *Coccoloba candolleana*. Several recent collections from Colombia have also been identified as this species. The Goudot specimen in the Berlin herbarium cited by Lindau is a fragment of a larger specimen in the Paris herbarium. A study of the latter sheet clearly indicates that this collection is to be referred to *C. padiformis* Meisner, the type of which is from Caracas, Venezuela.

Coccoloba caracasana Meisner, DC. Prodr. 14: 157. 1856; Howard, Jour. Arnold Arb. 40: 193. 1959.

Coccoloba caracasana f. *glabra* Lindau, Bot. Jahrb. 13: 211. 1890.

Coccoloba cyclophylla Blake, Contr. U.S. Natl. Herb. 20: 238. 1919.

In an earlier paper I discussed the significance of pubescence in this species and cited the collections seen from Mexico and Central America. *Coccoloba cyclophylla* Blake is now added to the synonymy of this species. Blake compared his species, based on *Curran* 47, from Colombia, with one from Hispaniola and concluded that they were distinct. A proper comparison would have been with *C. caracasana* from Venezuela, which is clearly the same.

Colombia. ATLÁNTICO: La Plaza, Juan Mina, *Dugand* 643 (Y); Molinero, *Dugand* 568 (Y). BOLÍVAR: Castillo Maldonado, *Sessé & Mociño* 5430 (F); San Martín de Loba, *Curran* 47 (US-type of *C. cyclophylla*; GH, Y). Magdalena, Santa Marta, *Smith* 1702 (A, GH); Tucurinca, *Romero* 1388 (US). LOCALITY NOT KNOWN: *Moritz* 1109 (BR, LE). **Venezuela.** APURE: San Fernando de Apure, *Grisol s.n.* (A, P). ARAGUA: Maracay, *Vögl* 1009 (M); San Juan de los Morros, *Alston* 6023 (BM). CARABOBO: Between San Joaquín and Mariara, *Pittier* 12111, 12112 (G, LE, M); Valencia, *Pittier* 8705 (GH). DISTRITO FEDERAL: Caracas, *Vargas* 30 (G); *Humboldt* 732 (Herb. Willd.); *Bonpland* 732 (B-holotype). GUARICO: El Sombrero, *Pittier* 11460 (A, G, GH, M), 12367 (M, NY); La Rubiera, *Pittier* 12328 (G, M). LARA: Between Yaritagua and Duaca, *Pittier* 343 (A, M). MERIDA: Tovar, *Fendler* 2053 (GH). YARACUY: Bruzual, *Curran* 642 (NY).

Coccoloba carinata Ruiz ex Meisner, DC. Prodr. 14: 150. 1856.

Meisner published this epithet in synonymy under *Muehlenbeckia leptobotrys* Meisner and stated that it was a manuscript name found in the herbarium at Berlin. I have not seen authentic material.

Coccoloba caurana Standley, Field Mus. Publ. Bot. 22: 73. 1940; L. Williams, Explor. Bot. Venez. 189. 1942.

Although the description of this species was published twice as new, the taxon belongs in the synonymy of *Coccoloba fallax* Lindau and is discussed in more detail under that name. The type, in the herbarium of the Chicago Natural History Museum, is *Williams* 11366, from Venezuela.

Coccoloba cerifera Schwacke, Pl. Nov. Mineir. 1: 7. 1898.

I have not seen the original publication to check the validity of this name and so, for the present, must interpret the species from the specimen indicated as the type in the Berlin herbarium. The plant is unlike any other species found in southern Brazil. It resembles *Coccoloba schomburgkii* in the shape and thickness of the leaves, but differs from it in having long pedicels from which the apparently staminate flowers have fallen. The Pires and Black collection cited below compares well with the type specimen.

Brazil. MINAS GERAIS: Serra do Cipó, *Schwacke 11780* (B-holotype), *Pires & Black 2816* (NY).

Coccoloba charitostachya Standley in A. C. Smith, Lloydia 2: 176. 1939.

The type of this species is *A. C. Smith 2356*, collected near the mouth of the Charwair Creek, in the basin of the Rupununi River, British Guiana. The holotype is in the herbarium of the Chicago Natural History Museum.

This species is not well defined in the original description and has not been recollected. Additional material is badly needed for an understanding of the species. At present the species may be characterized by the slightly rugose leaf blades which are elliptic-ovate in shape, rounded at the apex and lighter in color on the lower surface. The fruits are all insect-infested and abnormal and of no diagnostic value. Flowers are not known.

Coccoloba chacoensis Standley, Field Mus. Publ. Bot. 17: 239. 1937.

This species is to be referred to the synonymy of *Coccoloba spinescens*. *Coccoloba chacoensis* was based on *Cardenas 2529*, from Bolivia; the holotype is in the Chicago Natural History Museum. Buchinger and Sanchez (Bol. Soc. Argent. Bot. 7: 253. 1959) recognized this species and maintained it as distinct from *C. spinescens* Morong because of the absence of lateral branches terminating in spines and the presence of "glands" on the lower leaf surface. Although the Argentine botanists undoubtedly know these species in the field, the characteristics they have chosen to separate the species are not reliable in herbarium specimens. The holotype compares favorably with such collections as *Morong 882* (the type of *C. spinescens*) and *Hassler 11476* and *2486*.

Coccoloba confusa Howard, nom. nov.

Coccoloba declinata Martius, Beibl. Flora 20: 90. 1837; Meisner, Fl. Bras. 5(1): 29. 1855, as to plants, not as to name.

Coccoloba declinata var. *major* Meisner, Fl. Bras. 5(1): 30. 1855.

Coccoloba declinata var. *minor* Meisner, *ibid.*

Polygonum declinatum Vellozo (Flor. Flum. 162. 1825, Icon. 4: t. 41. 1827) was described briefly and in general terms. The illustration given

in the Icones is a poor one showing scarcely any characteristic of value in defining the taxa in *Coccoloba*. It was suggested by Dr. I. M. Johnston in his library notes that Pharmacopolis, the locality given, might be near the mouth of the Rio Taquari in the western part of the state of Rio near Paraty.

The transfer of the Vellozo name to *Coccoloba* made by Martius in an obscure paper is seldom correctly cited. Martius refers to two specimens, one from "Montem Talegraphi," in "Prov. Sebastianopolitana," and the other near Pendamonhangaba and Taubaté, in São Paulo. Martius' brief description of *Coccoloba declinata* is obviously based on the specimens cited and could scarcely be drawn from either the description or the plate given by Vellozo.

In 1855 when Meisner prepared the treatment of the genus for the *Flora Brasiliensis*, he described the species and established three new varieties: α *minor*, β *Velloziana* and γ *major*. For *Coccoloba declinata* var. *minor*, Meisner cited in reference "*Coccoloba declinata* Mart. Herb. propr." and a specimen from the Rio Doce collected April 1816 by Prince Maximilian. I have not seen this specimen in material from Brussels, Leningrad, Munich, or New York, the usual places for Martius and Meisner specimens. Meisner's variety, *Velloziana*, is based on the epithet and reference "*Polygonum declinatum* Vellozo Flor. Flum. IV. t. 41" and in place of a specimen Meisner cites "in prov. Rio de Janeiro."

Neither Meisner nor more recent authors cite the specimen from "Montem Talegraphi" which Martius mentioned in the original transfer of the Vellozo name. The specimen from Pendamonhangaba is referred by Meisner to his var. *major*.

Meisner prepared the treatment for *Coccoloba* in DeCandolle's *Prodrumus*, using the same broad concept of varieties comprising the species *C. declinata*. In this treatment, however, the assignment of var. *major* to the species is questioned.

In his monograph of the genus Lindau reduced to synonymy Meisner's varieties *minor* and *Velloziana*. Lindau recognized the var. *major*, but commented on the poor condition of the type specimen and suggested that it might be a new species.

There appear to be no Vellozo collections available; thus the interpretation of the species must be made from the inadequate original description and the rather poor drawing. In comparing the drawing with the specimens cited by Martius, Meisner and Lindau, I am convinced that these authors have misinterpreted Vellozo's species. Vellozo's drawing shows that a scrambling plant is intended, but the material cited by previous authors for *Coccoloba declinata* is shrubby, with geniculate branches. Again, the drawing shows a short, regular inflorescence, while the young inflorescences of the specimens cited by earlier authors are geniculate, with the older inflorescences elongate. The most obvious match for the Vellozo species is the Martius specimen cited as the type of *C. racemulosa*. This is a liana with short lateral branches and comparable

inflorescences. The venation of the type of *C. racemulosa* compares favorably with that illustrated by Vellozo, while the venation of specimens cited by Martius, Meisner and Lindau does not. It appears to me that the drawing of *Polygonum declinatum* Vellozo most nearly compares to *Coccoloba racemulosa* Meisner.

The material which Martius, Meisner and Lindau cited and described as *Coccoloba declinata* therefore requires a new name. I propose the name *C. confusa*, to call attention to this problem. Lindau's description (Bot. Jahrb. 13: 166. 1890) applies to the specimens cited, including those originally mentioned by Martius in transferring Vellozo's specific epithet.

The inclusion of the Krukoff and the Archer collections from Amazonas and Pará creates a sizeable gap in the known range of this species. On the basis of available material, these specimens must be assigned here.

Brazil. AMAZONAS: Humaytá near Livramento, *Krukoff* 6669 (NY). PARÁ: Belém, *Archer* 7830 (F, K). RIO DE JANEIRO: Caju, *Riedel* s.n. (LE); Copacabana, *Luschnath* s.n. (LE); Rio de Janeiro, *Glaziov* 3089 (BR), *Riedel* 675 (A, BR, LE, M), 676 (A, BR, LE, M); Telegraphenberg, *Luschnath*, Oct. 1833 (BR). SÃO PAULO: Pedamhongaba, Taubaté, *Martius* "66" (BR, LE, M—type of *C. declinata* var. *major*).

Coccoloba conduplicata Maguire, Bull. Torrey Bot. Club 75: 304. 1948.

A clear-cut species, but known only from the material cited in the original description. The folded leaf blade noted in the specific name appears to be of less significance than the author indicates, since the majority of the leaves are not conduplicate.

Surinam. Tafelberg, *Maguire* 24437 (A, BR; NY—holotype), 27205 (A, NY).

Coccoloba cordata Chamisso, Linnaea 8: 133. 1833.

Coccoloba candolleana Meisner, Fl. Bras. 5(1): 41. 1855.

Coccoloba cordata var. *praecox* Hassler, Repert. Nov. Sp. 14: 162. 1915.

Both Meisner and Lindau have indicated the similarity of *Coccoloba cordata* Chamisso and *C. candolleana* Meisner. Lindau distinguished between these in his key by placing *C. candolleana* in a group of species having leaves glabrous on both surfaces and *C. cordata* in one having leaves pubescent along the midrib and nerves on the lower surface. Lindau has placed the two species adjacent to one another in the text. Among the major characters of these species, Lindau described *C. candolleana* as having tomentose ocreae while those of *C. cordata* are glabrous.

The type collection of *Coccoloba cordata* is *Sellow* s.n. from the Rio Pardo area of Brazil. I have seen three sheets of this collection. One in the herbarium at Berlin bears the full data given by Chamisso and is selected as the lectotype. The other two were annotated only "*C. cordata* N."

The descriptions given by Chamisso and Lindau are not entirely accu-

rate. Various branches of the specimens comprising the type collection have puberulent or tomentose ocreae, although other portions are glabrous. Most of the leaves are coarsely pubescent along the midrib at the base of the leaf, but some are completely glabrous.

Coccoloba candolleana was based on *Blanchet 1818*. A single specimen is cited as being at Geneva while a smaller specimen from the Meisner herbarium, now at the New York Botanical Garden, bears several of Meisner's annotations: (1) "*C. cordata* Cham. ?" which he declared to be different on the basis of the shorter petiole and more coriaceous blades; (2) a variety of *C. cordata* named for Blanchet, a name which was not published, and finally (3) "*Coccoloba candolleana* n." The Blanchet collection has broader leaves and shorter petioles, but can be compared favorably with portions of the Sellow collection which is the type of *C. cordata*.

In his monograph Lindau included a collection from Colombia (*Goudot 4*) in the description of *Coccoloba candolleana*. This collection is better referred to *C. padiformis*, a species known from Venezuela and Central America (Howard, Jour. Arnold Arb. 40: 210. 1959).

Coccoloba cordata var. *praecox* Hassler was based on a specimen, *Hassler 7279*, from Paraguay which is staminate, in contrast to the pistillate type of *C. cordata*. The deciduous characteristic of the plant is not significant, and the variety is not worthy of recognition.

Argentina. CHACO: Barranqueras, Isla de Temores, *Curran 402* (US). FORMOSA: Comán, *Jórgensen 2064* (GH, US); Pirané, *Morel 432* (BR). JUJUY: San Pedro, *Di Lella and Garcia 2820* (A). MISIONES: Apóstoles on Río Chimiray, *Ibarrola 1150* (V). SALTA: Embaracación, *Eyerdam & Beetle 22916, 22928* (GH); Orán, Tabacal, *Schreiter 5472, 8455* (GH); Orán, Vespució a las Hablillas, *Schreiter 11492* (F); Río Blanco, *Venturi 5585* (F, GH, LE, M); Río Piedras, *Rodríguez 73* (F). TUCUMÁN: Capital, Barranca Colorada, *Venturi 955* (F); Raco, *Schreiter 1516, 8443* (GH). **Brazil.** BAHIA: *Blanchet 1818* (G, NY-type collection of *C. candolleana*). RIO GRANDE DO SUL: Rio Pardo, *Sellow s.n.* (B-lectotype; M). SÃO PAULO: *Gaudichaud 140* (P). **Paraguay.** CHACO: Villa Rica, *Balansa 3277* (G). Concepción, *Hassler 7279* (GH-type of *C. cordata* var. *praecox*).

***Coccoloba cordifolia* Meisner, Fl. Bras. 5(1): 37. 1855.**

Meisner cited several specimens but did not indicate a type. A sheet in the Delessert herbarium has been cited as the type by previous workers, although it bears two branches and two labels (*Blanchet 100* and *Blanchet 3528*). Meisner (DC. Prodr. 15: 155. 1856) suggested that *Coccoloba laevis* might be identical with *C. cordifolia*. Lindau (Bot. Jahrb. 13: 186. 1890) combined the two, accepting the older *C. laevis* Casaretto, a step which I believe to be correct.

***Coccoloba coronata* Jacquin, Enum. Pl. Carib. 19. 1760, Select. Stirp. Am. Hist. 114. t. 77. 1763; Dugand, Caldasia 4: 427. 1947; Howard, Jour. Arnold Arb. 41: 40. 1960, not Lindau, Symb. Ant. 1: 228. 1899.**

Coccoloba virens Lindley, Bot. Reg. 21: t. 1816. 1835.

Coccoloba novogranatensis Lindau, Bot. Jahrb. 13: 192. 1890; Howard, Jour. Arnold Arb. 40: 85-87, 208, 209. 1959.

Coccoloba dioica Karsten ex Lindau, Bot. Jahrb. 13: 170. 1890.

Coccoloba caribaea Urban, Symb. Ant. 5: 337. 1907.

Coccoloba waittii Johnston, Sargentia 8: 122. 1949.

The correct name of this species has evolved through the series of my papers cited above with the final correction suggested by one of Dugand's papers which I had overlooked. It is possible that *Coccoloba jagifolia* Jacq. should be assigned to the synonymy of this species as well. The identity of that plant will be discussed under that epithet.

I have not seen any material collected by Jacquin, and the species is regarded as typified by an illustration. Specimens from St. Vincent, south to Trinidad and Tobago, and from Guatemala and Panama are cited in earlier papers (Jour. Arnold Arb. 40: 85, 209. 1959). I have also examined the following specimens from South America.

Colombia. BOYACÁ: Between Anapoima & Apulo, *Triana* 978 (B, P-type of *C. novogranatensis*); El Humbo, *Lawrance* 760 (A); Santa Marta, *H. H. Smith* 2421 (A, BR). **BOLIVAR:** Sabanilla, *Karsten s.n.* (B, LE). **CAQUETÁ:** Hetuchá on Río Orteguaza, *Woronow & Juzepczuk* 6100 (F). **MAGDALENA:** Molino, *Haught* 4148 (F, NY). **DEPT. NOT KNOWN:** Pozo del Higuerón, *Usiacuri*, *Dugand* 788 (Y). **Ecuador.** El Oro, Arenillas, *Little* 6721 (F). **Peru.** **LORETO:** Río Putumayo, *Klug* 2240 (A, B, GH). **Venezuela.** **ANZOATEGUI:** Soledad, *Gines* 3913 (US). **BOLÍVAR:** Between Upata & Altagracia, *Steyermarck* 57681 (F). **DISTRITO FEDERAL:** Barrancas, *Tamayo* 1315 (US); Caracas, *Karsten s.n.* (LE-holotype of *C. dioica*). **SUCRE:** Cristóbal Colón, *Broadway* 143, 144, 491 (GH, NY, US). **ZULIA:** Perija, *Tejera* 91 (US). **DEPT. NOT KNOWN:** Sta. Ana, Paraguana, *Tamayo* 854 (US).

Coccoloba corrientina Rojas, Bull. Geogr. Bot. 28: 162. 1918.

The original description of this species is brief and generalized. No specimens are cited and, in fact, a broad general distribution is attributed to the species. Through personal correspondence I have learned from Dr. Maria Buchinger and other Argentine botanists that no Rojas collections can be attributed to this species. The species appears to be impossible to typify.

Buchinger and Sanchez (Bol. Soc. Argent. Bot. 7: 255. 1959) list *Coccoloba corrientina* as a questionable species, but suggest its similarity to *C. morongii*, the correct name of which is *C. paraguariensis*. I concur with this suggestion.

Coccoloba crescentiifolia Chamisso, Linnaea 8: 134-136. 1833, "*crescentiaefolia*."

The correct name of this species is *Coccoloba arborescens* (Vellozo) Howard based on *Polygonum arborescens* Vellozo. For a discussion of the nomenclature and additional synonymy see the previous paper in this

series (Jour. Arnold Arb. 41: 43–45. 1960). Specimens previously referred to this species are listed under *C. arborescens* above.

Coccoloba cruegeri Lindau, Bot. Jahrb. 13: 209. 1890.

Coccoloba ernstii Johnston, Proc. Am. Acad. 40: 685. 1905.

Coccoloba oblonga Lindau, Bot. Jahrb. 13: 136. 1890.

This species was based on a Crueger collection from Trinidad. Lindau described the fruits and assigned the species to the section *Campderia*. Currently available collections from Berlin and Göttingen are fragmentary and sterile. The specimen from the Trinidad herbarium appears to have had flowering parts at one time. There is some doubt as to what Lindau actually saw and described, for there is no evidence in the vegetative parts that the species is related to the others which he assigned to section *Campderia*.

Coccoloba oblonga Lindau was described at the same time as *C. cruegeri* and was based on *Riedel 614*, reported to be in “herb. Petrop.” I have now seen that specimen and the others cited below, and there is no question that *C. oblonga* is the same as *C. cruegeri*. The Riedel collection from Ilheos, Bahia, represents a sizeable, but not unlikely, extension of range. As Lindau indicated, the material is for all practical purposes sterile, although the specimens do have immature and poorly preserved inflorescences and flowers.

The range of this species is now from the islands of Trinidad and Margarita to British Guiana and Bahia in Brazil. Collections from Trinidad and Margarita were cited in an earlier paper (Jour. Arnold Arb. 40: 75, 76. 1959).

British Guiana. Ituribisi Lake, Essequibo Coast, *Forest Dept. B.G. 5474* (A, K). **Brazil.** BAHIA: Ilheos, *Riedel 614* (B, LE, P-type of *C. oblonga*); without specific location, *Blanchet 3160A* (P). **Venezuela.** SUCRE: Cristóbal Colón, *Broadway 697* (GH).

Coccoloba cujabensis Weddell, Ann. Sci. Nat. III. 13: 259. 1850.

Coccoloba longiochreata Hassler, Repert. Spec. Nov. Reg. Veg. 14: 162. 1915.

One specimen of *Martius 1241* in the Munich herbarium has been designated as the lectotype of this species. *Coccoloba cujabensis* is suggestive of *C. ruiziana* Lindau, but field study or additional collections are necessary to determine their correct relationship.

Hassler compared his new species, *Coccoloba longiochreata*, with *C. alagoensis* Weddell and *C. floribunda* Lindau. He distinguished it on the basis of the larger ocreae. The type selected by Hassler is a vigorous staminate flowering specimen. The type of *C. cujabensis* is a fruiting collection. On the basis of vegetative characteristics they are similar, and any question is resolved by a study of the Werdermann and Kuntze collections cited below. These show the intermediate conditions of ocreae and leaf venation between the type specimens of *C. cujabensis* and *C.*

longiochreata. *Coccoloba cujabensis* is not at all comparable to *C. alagoensis* or "*C. floribunda*."

Bolivia. Beni, Trinidad, Misiones Guarayos, *Werdermann 2366* (MO). **Brazil.** MATO GROSSO: Corumbá, *Kuntze s.n.* (NY); Cuyabá at Patricio da Silva Manso, *Martius 1241* (B, BR, LE; M-lectotype). **Paraguay.** Chaco, *Fiebrig 1284* (M-type collection of *C. longiochreata*).

***Coccoloba cyclophylla* Blake, Contr. U. S. Natl. Herb. 20: 238. 1919.**

The type is *Curran 47*, from San Martín de Loba, Dept. Bolivar, Colombia (US 537207). Blake compared his new species with "*Coccoloba rotundifolia* Meisner," now known as *Coccoloba leoganensis* Jacq., from Hispaniola. There is no question that *C. cyclophylla* is the same as *C. caracasana* Meisner, which was based on material from Caracas, Venezuela.

***Coccoloba cylindrostachya* Lindau, Bot. Jahrb. 13: 163. 1890.**

Lindau described consecutively *Coccoloba cylindrostachya* (based on *Glaziou 13135*) and *C. glaziovii* (based on *Glaziou 8089*) in his monograph of the genus. Both collections were made in the vicinity of Rio de Janeiro. An examination of the specimens fails to support the differences which Lindau felt would separate the two species. Therefore, *C. cylindrostachya* has been referred to the synonymy of *C. glaziovii*.

[To be continued]

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STUDIES IN THE GENUS COCCOLOBA, IX. A CRITIQUE ON THE SOUTH AMERICAN SPECIES *

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Coccoloba declinata (Vellozo) Martius, Beibl. Flora 20: 90. 1837;
Meisner, Fl. Bras. 5(1): 29. 1855, as to name only.

Polygonum declinatum Vellozo, Flor. Flum. 162. 1825; Icon. 4: 41. 1827.

Coccoloba racemulosa Meisner, Fl. Bras. 5(1): 30. 1855.

Coccoloba declinata var. *velloziana* Meisner, *ibid.*

A full discussion of the identity of *Coccoloba declinata* has been given under the name *C. confusa*.

In the original description of *Coccoloba racemulosa* Meisner cited only an unnumbered specimen, now in the herbarium at Munich, which was collected in September, 1818, along the river San Francisco near Carinhanha in Minas Geraes, Brazil. Lindau placed a fragment of this Martius collection in the Berlin herbarium, but in his monograph he also cited *Perrottet* 83 from British Guiana. I have seen the latter collection and have referred it to *C. lucidula*. Both *C. declinata* and *C. lucidula* are poorly represented by herbarium material. When additional collections are available for study the relationship of these two species should be re-examined.

Coccoloba declinata, as represented by the Martius collection, is not well defined. The type specimen has partially mature leaves and functionally staminate flowers. The distinguishing characteristic, given by both Meisner and Lindau, is the origin of the ocreolae at the apex of the pedicel. However, careful dissection proves that this is an effect of drying and that while the ocreolae are fused to the pedicels in the type specimen, they may be free in other collections. The species is similar to *C. ilheensis*, *C. bracteolosa* and *C. glaziovii*, differing in the more scandent habit, the shorter inflorescences and the smaller leaves, though this characteristic may be due to immaturity. Field studies or additional collections may clarify the relationship of these species.

* Continued from volume XLI, p. 229.

Coccoloba densifrons Martius ex Meisner, Fl. Bras. 5(1): 26. *pl.* 7. 1855.

Coccoloba barbeyana Lindau, Bot. Jahrb. 13: 185. 1890.

Coccoloba pichuana Huber, Bol. Mus. Goeldi 5: 342. 1909.

Coccoloba douradensis Glaziou, Bull. Soc. Bot. Fr. IV. 11(Mem. 3f): 571. 1911 (provisional name with mixed type).

Although Lindau recognized *Coccoloba densifrons* in his monograph (Bot. Jahrb. 13: 177. 1890), citing the holotype (*Martius s.n.*, from Ega in Brazil), he did not include the species in his key to the genus.

Coccoloba barbeyana is based on a Ruiz and Pavon collection from Peru, but I fail to find any reliable differences between these species, either in Lindau's descriptions or in the specimens he annotated.

Coccoloba pichuana Huber was based on a Ducke collection from Obidos, Brazil. In the original description it was compared with *C. padiformis*, a very similar species occurring on the north coast of South America and in Central America. At present the two species are distinguished on the basis of leaf size and shape and the nature of the venation, but these differences may prove to be unreliable when both species are represented by more adequate material. For the present, therefore, the authentic material of *C. pichuana* is best referred to the synonymy of *C. densifrons*.

I have indicated previously (Jour. Arnold Arb. 41: 46. 1960) that *Coccoloba douradensis*, published as a provisional name with a short, four-word description, is best considered as a *nomen nudum*. Furthermore, the collection cited by Glaziou is a mixture, parts of which are *Coccoloba marginata* Benth. while the remainder is more correctly assigned here.

Another specimen which may be referred to *Coccoloba densifrons* is *Haenke s.n.*, collected in Peru on May 24, 1897, and now in the Berlin herbarium. The sheet, bearing Gross' annotation label, has been given an unpublished name referring to the city of Guayaquil.

Coccoloba densifrons is similar to *Coccoloba sphaerococca* (*C. padiformis*), the former being known only in flower and the latter in fruit. Additional collections may prove these to be the same. On the basis of the specimens I have seen, they are presently to be distinguished by the finely reticulate upper leaf surface of *C. sphaerococca*, in which the primary veins are scarcely evident. In *C. densifrons* the primary veins are arcuate and clearly evident, impressed above but sharply ridged when dry.

Brazil. ACRE: Ule 9348 (G, K). AMAZONAS: Borba, Rio Madeira, Ducke 466 (A, F, K, NY, US); Ega, on Rio Negro, Martius s.n. (M-lectotype, B, NY); Humaytá near Tres Casas, Krukoff 6120, 6228 (A, BR, LE, NY); Rio Embira, Krukoff 4667 (G, LE, NY); São Paulo de Olivença near Palmares, Krukoff 8331 (A, BR, F, LE, NY). GOYAZ: Serra Dourada, Glaziou 21978 (P—in part, type of *C. douradensis*). PARÁ: Obidos, Ducke 4866 (BM—type of *C. pichuana*). **Colombia.** ANTIOQUIA: Río Carepa, Haught 4722 (NY, US). MAGDALENA: Santa Marta, Espina 87 (Y). META: Sierra de la Macarena, Philipson, Idrobo & Jaramillo 2104, 2265 (GH). PUTUMAYO: Río Putumayo, Cuatrecasas 10820 (US). Dept.

unknown: Aguaviva, *Dugand* 850 (Y); Arroyo de Piedras and Luruaco, *Dugand* 985 (Y); Molinero, *Dugand* 573 (Y); Río Toribio, *Espina and Giacometto* A95 (F, Y); Río Tukurinca, *Dugand* 1012 (Y). Ecuador. Guayaquil, *Haenke* 2288 (NY), *s.n.* (B). Peru. LORETO: Florída, Río Putumayo, *Klug* 2260 (A, F, GH, NY); Gamitana Cocha, Río Mazán, *Schunke* 76 (A, F, NY); Iquitos, Mishuyacu, *Klug* 1077 (F, NY); Iquitos, Rancho Indiana, *Mexia* 6426 (F, GH); Puerto Arturo, Yurimaguas, *L. Williams* 5138 (F); Ucayali, *Tessmann* 3399 (G, NY, US). SAN MARTÍN: Chazuta, Río Huallaga, *Klug* 4127 (F, GH, NY). Without definite locality: *Ruiz & Pavon s.n.* (G-type of *C. barbeyana*).

***Coccoloba dioica* Karsten ex Lindau, Bot. Jahrb. 13: 170. 1890.**

A single fragmentary specimen in the Leningrad herbarium, to which is attached Karsten's embossed label, bears this epithet. I have previously referred this species, the type of which was collected near Caracas, Venezuela, to the synonymy of *Coccoloba coronata* Jacq. (Jour. Arnold Arb. 41: 40. 1960).

***Coccoloba dioica* Steudel, Nomen. Bot. 390. 1841.**

Lindau (Bot. Jahrb. 13: 220. 1890) refers this epithet to *Muhlenbeckia sagittifolia* Meisner. The name is used in a list without description by Steudel, and was reported to apply to a species from Chile. I have not seen any specimens bearing this name.

***Coccoloba diversifolia* Jacquin, Enum. Pl. 19. 1760; Hist. Stirp. Am. 114. *pl.* 76. 1763; Howard, Jour. Arnold Arb. 30: 421-424. 1949, 40: 195-196. 1959.**

Although this species is listed in several floristic treatments of South America, I have not seen correctly identified specimens from the area. Jacquin attributed the species to Hispaniola in his second treatment and I have previously cited specimens from the Greater Antilles, Antigua, Mexico, British Honduras, Guatemala and Florida.

***Coccoloba dugandiana* A. Fernandez, Mutisia 5: 1. 1952.**

There is no question that this is a distinct species, but unfortunately Fernandez' description has been based on what must be considered anomalous material. Furthermore, he did not indicate that the species was dioecious, or that the flowers he described were functionally staminate. The abnormally emarginate leaves of the type are not characteristic of the species. Fernandez' statement that the immature achenes are pubescent is in error, for the fruiting perianth, not the achene, is pubescent.

Additional collections by Cardona and Llewelyn Williams from the Bolivar and Amazonas regions of Venezuela represent the pistillate plants to be assigned to this species. Whether these are typical I cannot determine. The leaves of these collections are comparable to the type in the thickness of the blade, the denseness of the vein reticulations and the

pubescence. However, all the leaves are smaller and of contrasting shapes, the blades varying in shape from ovate, obovate or oblong to obovate-elliptic, and in size from 12×10 or 14×7 to 15×11 cm. long and broad. The leaf base is rounded or truncate and slightly cordate. The apex is obtuse to acute or slightly apiculate. The petioles of the mature leaves are approximately 1.8 cm. long. The inflorescences of these specimens are at most 10 cm. long and 7 cm. wide. Individual branches of the inflorescence are densely flowered and all parts of the flower, including the rachis, are densely tomentose. The tomentum on the perianth characterizes this species. Only three fruits remain attached to the specimens and all are crushed, indicating that the perianth is fleshy. The hypanthium surrounding the mature achene is only slightly vascular. The mature fruit is distinctly pubescent, a most unusual condition in this genus.

It is not clear how the leaf shape of this species will finally be defined. Certainly the pubescent leaves, the compact pistillate inflorescence, and the pubescent fruit clearly distinguish it at present. Additional collections of this species from the interior of Colombia and Venezuela are needed.

Colombia. BOYACÁ: Caño Guira near mouth of Río Meta, *Haught 2624* (US-isotype). **Venezuela.** AMAZONAS: Río Orinoco between San Fernando de Atabapo and San Antonio, *J. Silverio Level 41* (A); Sanariapo, *Williams 15961* (A, F), *16042* (F). BOLÍVAR: Alto Río Paragua, *Cardona 1183* (NY, US).

Coccoloba erecta Glaziou, Bull. Soc. Bot. Fr. IV. 11(Mem. 3f): 572. 1911.

This specific name must be considered a *nomen nudum*, for Glaziou's description states only, "Arbuste droit, fl. blanc jaunâtre." He cited his own collection number 14220 which, unfortunately, is a mixture. Glaziou apparently mixed his field tags and numbers for the sheet of *Glaziou 14220* in the Paris herbarium bearing the annotation "Coccoloba erecta Glaz. n. sp." is actually *C. schwackeana*, while a comparable specimen in the Berlin herbarium, *Glaziou 14219*, is one of two specimens cited by Lindau in describing *C. schwackeana*.

Coccoloba ernstii Johnston, Proc. Am. Acad. 40: 685. 1905.

This species has been referred to the synonymy of *Coccoloba cruegeri* Lindau in earlier papers (Jour. Arnold Arb. 40: 74. 1959, 41: 228. 1960). *Coccoloba ernstii* was based on *Johnston 250* (GH) from El Valle, South Hill, Margarita Island, Venezuela.

Coccoloba excelsa Benthham in Hooker, London Jour. Bot. 4: 624. 1845.

C. micropunctata Eyma, Meded. Bot. Mus. Utrecht 4: 1. 1932.

C. parimensis var. *hostmanni* Meisner, Fl. Bras. 5(1): 35. 1855.

Although I have examined the material cited by Eyma, as well as additional specimens, I cannot distinguish between *Coccoloba excelsa* and *C.*

micropunctata. Eyma believed that *C. micropunctata* could be distinguished on the basis of its narrow, tubular, membranaceous ocreolae and its non-punctulate leaves and inflorescences. The ocreolar distinction appears to be weak, varying with the age and the sex of the flowering material. In the description of *C. micropunctata* Eyma reported his material as "sub lente dense glanduloso(?) -punctulatae," although an examination of his material indicated broken hairs and clear or black hair bases which are comparable to structures often called punctations in *C. excelsa*. *Coccoloba micropunctata* is based on material collected from vines, but the writer's experience in the West Indies indicates that leaf shape and size, as well as texture and pubescence, varies widely in lianas.

In the original description of *Coccoloba parimensis*, Benthams based the species on Schomburgk material from Rio Parime. He reported further that "*Hostmann 245* from Surinam may possibly be a variety of the same species." Meisner (Fl. Bras. 5(1): 35. 1855) described this Hostmann collection as *C. parimensis* var. *hostmanni*. Lindau (Bot. Jahrb. 13: 170. 1891) assigned this same material to the synonymy of *C. excelsa*.

British Guiana. Bartica, *Linder 50, 151* (GH, NY); Berbice, *Schomburgk 178* (B), *400* (K-holotype, NY); Malali, Demerara River, *De la Cruz 2737* (GH, NY). **French Guiana.** Acarouany, *Sagot s.n.* (A, P); Caroni, *Melinon s.n.* (GH, P). **Surinam.** Goddo, *Stahel 77* (U-type of *C. micropunctata*); Gonini, *B.W. 3741* (A, NY); Kwatta hede, Saramacca River headquarters, *Maguire 23927, 23929* (A, NY); without specific location, *Hostmann 245* (B-type of *C. parimensis* var. *hostmanni*), *Wulfschlagel 804* (GOET).

***Coccoloba excoriata* Linnaeus, Syst. Nat. ed. 10. 1007. 1759.**

Lindau's treatment of *Coccoloba excoriata* (Bot. Jahrb. 13: 211-212. 1891) is confusing. Of the many specimens which he cited, the ones I have seen should be referred to *C. venosa*. I have not seen a Widgren specimen from Rio de Janeiro to which he referred, nor the one which Schomburgk referred to as "Fl. & Faun. Br. Guy. 821." This reference is to "*Coccoloba nivea*," a synonym of *C. venosa* which applies to a plant under cultivation. *Coccoloba venosa* is represented in the native flora of South America and will be discussed later. *Coccoloba excoriata* L., as correctly applied, is a synonym of *C. tenuifolia* L. (Howard, Jour. Arnold Arb. 38: 93. 1957), a native species of the Bahamas, Cuba and Jamaica, and has not been reported as either a cultivated or an indigenous plant of South America.

***Coccoloba fagifolia* Jacq. Hort. Schonbr. 3: 55. pl. 352. 1798.**

Although Jacquin published an excellent plate of this species and attributed the plant to the vicinity of Caracas, the species has not been collected or recognized in recent years. I find Jacquin's species difficult to place. In the Meisner herbarium, now at the New York Botanical Garden, there is a packet with three detached leaves bearing the legend, "*Coccoloba fagifolia* Jacq. H.S. (mann tremula, verisim. ipsius Jacquini patris script.) folia speciminis sterilis Herb. Jacquini in Hb. Mus. Vindo-

bon.” This appears to represent one of the specimens cited by Meisner in his treatment of the species for DeCandolle’s *Prodromus* (14: 165. 1856–“v.s.c. ex Schoenbr. in herb. Jacq. patr. et fil.”). These three leaves have long, thin petioles and blades of thin texture. They do not represent any species of *Coccoloba* known to me, and there is no evidence that they even belong to the genus. Moreover, these detached leaves do not compare favorably with the original illustration.

Lindau (Bot. Jahrb. 13: 162. 1890) recognized the species and cited a specimen collected by Boos which was in the Vienna herbarium. However, since the *Coccoloba* material in that herbarium was destroyed during World War II, the material which Lindau cited cannot be identified. Presumably the Boos specimen was a small one, for Lindau accumulated for the Berlin herbarium a large number of fragments from important species, but *C. fagifolia* is not represented in the material which I have on loan from that herbarium. No recent material has been assigned to *Coccoloba fagifolia*, so its interpretation must rest on the original illustration, although a comparison of Jacquin’s plate with that of *C. virens* Lindley (Bot. Reg. 21: pl. 1816. 1836), which is *C. coronata*, shows many similarities. If Jacquin’s plate may be accepted as representing an accurate description, then it seems clear that *C. fagifolia* should be assigned to the synonymy of *C. coronata* Jacq. The proper identification of the Jacquin material in the Meisner herbarium remains unsolved.

***Coccoloba fallax* Lindau, Bot. Jahrb. 13: 172. 1890.**

Coccoloba caurana Standley, Publ. Field Mus. Bot. 22: 73. 1940; Llewelyn Williams, Explorac. Bot. Guayana Venez. 189. 1942.

Coccoloba fallax seems to be distinguished by the fascicled inflorescence of simple racemes, the conspicuously large ocreae, especially those clustered at the apex of the stem and around the racemes, and the strongly keeled midrib. The type collection of *Coccoloba caurana* has immature inflorescences, but comparable mature material has been found in Trinidad. There is no question that *C. caurana* is the same as *C. fallax*.

The Trinidad specimens have been cited in a previous paper, in which the species was also recognized as occurring in Venezuela (Jour. Arnold Arb. 40: 79. 1959). The type of *C. fallax* is *Crueger 114*. The lectotype selected is the specimen in the Göttingen Herbarium. The holotype of *C. caurana* is *Llewelyn Williams 11366* (F).

***Coccoloba fasciculata* Meisner in Warming, Symbol. Floram Bras. 6: 128. 1870.**

Lindau cited this epithet and reference in the synonymy of “*C. longipendula*” in his monograph (Bot. Jahrb. 13: 177. 1890). The original publication is a report on Warming’s collections from Brazil. One entry is “*Coccoloba fasciculata* Wedd., Meissner in DC l.c. 166 and Mart. l.c. 27,” with a citation of “Lagoa Santa: . . . Serra da Piedade legit Warm-

ing Jan.-Febr. florentem." This is obviously a misidentification and not a new entity, as Lindau implied. Lindau referred the epithet to the synonymy of *C. longependula*, which I cannot distinguish from the older *C. sticticaulis* (q.v.). Lindau also cited the Warming collections as follows: "Rio de Janeiro in silvis ad Lagoa Santa: Warming n. 129; ad radices montis Serra da Piedada: Warming n. 126." I have seen specimens of each and have referred them to *C. sticticaulis* Weddell.

Coccoloba fasciculata Weddell, Ann. Sci. Nat. III. 13: 258. 1849.

I have discussed this species in an earlier paper (Jour. Arnold Arb. 41: 44. 1960) and have referred it to the synonymy of *Coccoloba arborescens* (Vellozo) Howard. *Coccoloba fasciculata* Weddell was based on *Blanchet 796* collected in Bahia Province, Brazil. The type is in Geneva.

Coccoloba fastigiata Meisner, Fl. Bras. 5(1): 34. 1855.

Coccoloba goudotiana Meisner, Fl. Bras. 5(1): 35. pl. 13, fig. 1. 1855, not Weddell.

In the original description Meisner described the species and a variety " β glabrata," and cited specimens to illustrate both taxa. This is contrary to his usual practice, in the same volume and treatment, of considering the species to consist of varieties for which specimens are cited. The variety *glabrata* Meisner, represented by "*Schott 5537 (914)*" and part of *Schott 5540* (in Vienna), is better assigned to *Coccoloba mosenii*.

For the type variety of the species, Meisner cited *Schott 5540*, collected in Rio de Janeiro Province, Brazil, and *Schomburgk 1262*, in the Berlin herbarium. The latter collection was supposedly made in British Guiana. Lindau, who worked with the Berlin material around the year 1890, mentioned the Schomburgk collection under the name *Coccoloba fastigiata*, but attributed it to Meisner, "pr. p. ex. Meissn." I cannot determine whether Lindau actually saw this material, but I suspect that he did not, for in his citation of specimens seen (Bot. Jahrb. 13: 224. 1890) he listed *Schomburgk 1262* as *C. marginata*. I have on loan the *Coccoloba* material from the Berlin herbarium and I fail to find the Schomburgk collection represented. I suspect that Meisner was in error in including the Schomburgk specimen and that *C. fastigiata* should be typified only by *Schott 5540*. Meisner stated that the specimen he saw was in the Vienna herbarium. Unfortunately, the *Coccoloba* material in this herbarium was destroyed during World War II. A photograph and a fragment of the holotype is at the Chicago Natural History Museum, and a more complete specimen is in Brussels. Therefore it seems wise to designate the specimen at Brussels as the lectotype.

Coccoloba goudotiana Weddell was based on a Goudot specimen collected near San Luis, Colombia, and now in the Paris herbarium. Meisner elaborated on the original description and illustrated the species. In addition to the Goudot specimen, Meisner also cited a collection by Pohl in

the Zuccarini herbarium at Munich. I have seen both of these specimens and it seems clear that the illustration in *Flora Brasiliensis* was made by combining features present in both specimens. *Coccoloba goudotiana* Weddell is *C. obovata*, while *C. goudotiana* as described and illustrated by Meisner is *C. fastigiata*.

Brazil. RIO DE JANEIRO: Aguacú, *Schott 5540* (BR-lectotype, F-photo and fragment of Vienna material); Maná, *Glaziou 7888* (B, C, P); Realengo near Sapopemba, *Glaziou 11441* (LE, P); without specific locality, *Janz s.n.* (LE). Without locality: *Pohl s.n.*, in Herb. Zuccarini as cited by Meisner (M).

***Coccoloba fastigiata* var. *glabrata* Meisner, Fl. Bras. 5(1): 34. 1855.**

Meisner cited "*Schott 5537 (914)*" and, in part, *Schott 5540* as representatives of his new variety with specimens in the Vienna herbarium. Lindau recognized the variety (Bot. Jahrb. 13: 172. 1890), citing *Schott 5537* and *Pohl 914* with specimens at Vienna and Berlin. The Vienna material has been destroyed and material from these collections is not included in the specimens of *Coccoloba* from the Berlin herbarium. A photograph of *Schott 5540* and a fragment of this specimen from Vienna are preserved in the herbarium of the Chicago Natural History Museum and clearly identify the specimen as *C. fastigiata*. It appears that the fragment of *Schott 5537* (F), all that remains of the collection, should be referred to *C. mosenii* Lindau (q.v.).

***Coccoloba ferruginea* Endlicher, Catalogus Hort. Acad. Vind. 1: 274. 1842; Ettingshausen, Blattskel. d. Apetalen 91. pl. 26. fig. 2. 1858.**

Lindau referred this epithet to the synonymy of his *Coccoloba excoriata* (q.v.). Endlicher cited the name without description as a plant which had been obtained from the Berlin botanic gardens and was cultivated in Vienna gardens. Ettingshausen illustrated a leaf skeleton, using the name *Coccoloba ferruginea*. He acknowledged that his material was from a cultivated specimen, but did not discuss the illustration or the species. The leaf skeleton is inadequate for positive identification, although it is probably *C. venosa* L.; none of the specimens I have seen bears the name *C. ferruginea*.

***Coccoloba filipes* Standley, Trop. Woods 40: 14-15. 1934.**

In the original description Standley wrote, "the distinctive characters of the species are the greatly elongate, many-flowered, lax racemes, with flowers on conspicuously long and slender pedicels." The type, *Dugand 380*, was collected in flower at Santa Rosa, west of Barranquilla, Colombia, on March 13, 1933. The flowers, although borne singly at each nodule on the inflorescence axis, are apparently functionally staminate, producing pollen grains. The specimen, now at the U.S. National Herbarium, bears two terminal, thin-textured, darkened leaves, suggesting that the plant is deciduous. The leaves arise from above the base of the ocreae.

No additional material which can be referred to this species has been seen. It appears to be distinct among the Colombian species of the genus and, on the basis of the material available for study, is not closely related to or even similar to any other South American species thus far described. Although several species from Cuba or Puerto Rico have similar long pedicels, none are so tenuous.

Coccoloba firma Martius ex Colla, Herb. Pedem. 5: 48. 1836; Eyma, Meded. Bot. Mus. Utrecht 4: 3. 1932.

The original description, while brief, is explicit and clearly intended to be that of a new species. In a list of species Colla attributed the name to Martius. No more definite location than Brazil was given. Eyma also used the name attributed to Martius in comparing it with his proposed new species, *Coccoloba micropunctata*. Eyma cited specimens at Kew and the Natal Herbarium, Durban, which he said were listed under the name *Coccoloba populifolia* Weddell. The correct name for the latter species is *C. alnifolia* Casaretto. Eyma apparently recognized both *C. firma* and "*C. populifolia*." I have not seen the specimen from the Natal Herbarium, South Africa, nor have I been able to locate a specimen so named at Kew. There is a Martius sheet at the British Museum bearing the name *C. firma*, which I believe is properly *C. alnifolia*. No material of *C. firma* was found in the collections of Martius which I have on loan from Munich, Brussels and Leningrad. I am therefore reluctant to accept this unsupported name until the material which Colla saw, or at least that which Eyma cited, has been located. If this should prove to be the same as *C. alnifolia* Casaretto (1844), as I suspect, the older *C. firma* Martius ex Colla should be accepted as the correct name.

Coccoloba gardneri Meisner, Fl. Bras. 5(1): 36. pl. 15. 1855; Howard, Jour. Arnold Arb. 41: 44. 1960.

This species is based on *Gardner 600* from Serra dos Orgaos, Brazil. In the original description, which is clearly based on the Gardner collection, Meisner cited *Polygonum frutescens* Vellozo in synonymy and also *Coccoloba vellosiana* Casaretto, the latter with some doubt. I have previously considered the identity of species described by Vellozo and Casaretto and have also concluded that *C. gardneri* Meisner represents still a third species. Meisner's species was placed in the synonymy of *C. crescentiifolia* by Lindau, but clearly it is not the same as *C. arborescens* (Vell.) Howard, *loc. cit.* I cannot adequately define the species on the basis of the single collection available and wish to call this problem to the attention of future collectors who may visit the area of Rio de Janeiro.

Coccoloba glaziovii Lindau, Bot. Jahrb. 13: 163. 1890.

Coccoloba cylindrostachya Lindau, Bot. Jahrb. 13: 163. 1890.

Coccoloba sublobata Heimerl, Denkschr. Akad. Wien. Math.-Nat. Klasse 79: 244. 1908.

Glaziou 8089 is the only collection cited by Lindau in the original description. Of the specimens cited from four herbaria, I have designated that at Berlin as the lectotype.

I am unable to distinguish between *Coccoloba glaziovii* and *C. cylindrostachya* which Lindau based on *Glaziou* 8089 and 13135 respectively. Lindau distinguished between them by placing *C. glaziovii* in a group of species with the rachis glabrous and *C. cylindrostachya* in a contrasting group having the "rachis vario modo pilis instructa." His species descriptions amplify this supposed difference and suggest others, e.g., the position of the petiole in relation to the base of the ocrea, which, however, is not borne out in a re-examination of the type specimens cited. I have seen all of the specimens which Lindau cited from both collections and can only conclude that one species is represented.

Glaziou 3087 was annotated by Lindau as a possible new species. It is a vigorous shoot, probably adventitious in nature, with longer internodes, larger leaf blades and more pubescent parts. Lindau never published the name written on the sheet. I believe the specimen should be included in *Coccoloba glaziovii*. Another unpublished name honoring Lindau is found on the collection *Schwacke* 13673 with the author given as Schwacke. Although the specimens seen have more delicate branches, more tenuous and pendant inflorescences and more oblong leaves, I feel that this material is properly assigned to *C. glaziovii*.

The Chicago Natural History Museum has a photograph of the holotype of *Coccoloba sublobata* which was in the herbarium at Vienna. The type was lost during World War II and the only duplicate of this collection which I have seen is in the Berlin Herbarium. This Berlin specimen bears an unpublished name, attributed to Heimerl and referring to the subundulate leaves, which is more appropriate than the one actually published. Although the type of *C. glaziovii* is a staminate plant, there is no question that Wacket's collection represents the same species in fruit. Heimerl's original description does not refer to the type collection by number. The number 12 cited below is legible in the photograph of the type and on the isotype.

In his monographic treatment of *Coccoloba striata* (Bot. Jahrb. 13: 164–165. 1890), Lindau cited numerous specimens from the Brazilian states of Bahia, São Paulo, Rio and Pernambuco. I have seen only one of these, *Mosén* 3664, which I believe to be more properly associated with *C. glaziovii*. *Coccoloba striata*, based on a Schomburgk collection from the Roraima area, appears to be a northern species. The remainder of the collections cited by Lindau should be examined for their correct relationship here.

Brazil. MINAS GERAES: Itabira do Matto Vento, *Schwacke* 13673 (B, P). PARANÁ: Volta Grande, *Dusén* 11966 (GH, NY). RIO DE JANEIRO: Rio de Janeiro, *Glaziou* 3087 (BR), 8089 (B-lectotype, BR, C, G, GH, LE, S), 13135 (type collection

of *C. cylindrostachya*, B, BR, G, LE). SÃO PAULO: Serra do Cubatao, near Santos, *Wacket* 12 (B-isotype of *C. sublobata*); Sorocaba, *Mosén* 3664 (P).

Coccoloba goudotiana Weddell, Ann. Sci. Nat. III. 13: 260. 1849.

This species is based on *Goudot s.n.* from San Luis, Colombia. The type specimen is in the Paris herbarium and the species is clearly synonymous with *Coccoloba obovata* HBK. (1817).

Coccoloba goudotiana Weddell sensu Meisner, Fl. Bras. 5(1): 35. *pl.* 13. *fig.* 1. 1855.

In the original publication Meisner did not intend to describe a new species, but only to list the Weddell species. However, he cited the Goudot material used by Weddell, as well as a Pohl collection from the Zuccarini herbarium which is not the same species. Meisner's description and illustration combined features of both plants. I have seen the Pohl specimen, now in the Munich herbarium, and refer Meisner's interpretation of *Coccoloba goudotiana* to the synonymy of *C. fastigiata* Meisner.

Campderia gracilis Meisner, Fl. Bras. 5(1): 23. *pl.* 6. 1855; DC. Prodr. 14: 170. 1856.

Meisner described and illustrated this species in 1855. He cited a Spruce collection without giving a collector's number from around Barra in the "Prov. Rio Negro." The following year in the *Prodromus* he cited *Spruce* 958, reporting specimens to be in the DeCandolle Herbarium and the *Herbarium Monacense* (Munich). The illustration in *Flora Brasiliensis* appears to be a compilation of the two specimens. The original pencil sketch of the illustration of flowers and fruits is attached to the sheet at Munich and this sheet should be designated as the lectotype. However, I cannot determine the source of the fruiting material which Meisner illustrated, since comparable achenes do not appear on either sheet at the present time. Lindau referred *Campderia gracilis* to the synonymy of *Coccoloba ovata* Benth. This appears to be the correct specific placement on the basis of the material I have examined, but there is a question as to whether *C. ovata* belongs in the genus *Coccoloba*. This matter will be discussed further under *C. ovata*. I have seen specimens of *Spruce* 958 from Munich (lectotype), Berlin, Geneva, the Gray Herbarium, Leningrad and Paris.

Coccoloba gracilis HBK. Nov. Gen. 2: 176. 1818.

Two specimens, one in the Willdenow Herbarium and one at Paris, can be considered to be authentic for this species. Both are relatively small and are characterized by slender, nearly geniculate inflorescences of functionally staminate flowers. The original description has information applicable to labels on both specimens but does not exactly match either. It

appears desirable to consider the Paris specimen as the lectotype since the only label on this sheet bears the number 3498 of Humboldt and the geographic location Rio Cachiyacu given at the time of publication.

These two specimens are inadequate for accurate determination as to genus. The floral structure and that of the ocreolae and the bracts appear to bridge the few weak characteristics used to distinguish *Coccoloba* and *Ruprechtia* in staminate flowering condition. With the material available, the only possible course to follow is that taken by the previous authors and monographer who placed the species in *Coccoloba*. Additional material is needed to determine its correct position.

Macbride (Publ. Field Mus. Bot. 13: 460. 1937) assigned a fruiting collection, *Weberbauer 6982*, to this species in his treatment for the *Flora of Peru*. The Weberbauer collection bears no data regarding the plant or the place of collection beyond "Peru." The old inflorescence axes are 4–8 cm. long and are erect. The fruiting peduncles are 2–2.5 mm. long. Fruits, one of which retains the fruiting calyx, are preserved in a packet. The perianth lobes are free nearly to the base in the fruit. The achene is only slightly triangular in outline, dark brown and shiny. This specimen is clearly a *Coccoloba*, though not necessarily the same as the authentic material of *C. gracilis* HBK.

Peru. Río Cachiyacu, *Humboldt 3498* (p-lectotype; without number or location [Herb. Willd. 7701]).

Coccoloba grandiflora Lindau, Bot. Jahrb. 13: 175. 1890.

Lindau cited two collections in the original description, *Glaziou 14217* and *Miers 4657*. The former should be selected as the type collection and the specimen at Copenhagen designated as the lectotype. This is the only sheet among those cited below on which the label states, "*Coccoloba grandiflora* Lindau n. sp." Lindau's work was based upon the material in the Berlin herbarium—the fragment of a branch together with one inflorescence having one detached and two attached leaves. I have not located the Miers collection.

Superficially, this species resembles *Coccoloba tenuiflora* Lindau which is based on cultivated material of unknown origin. The type of *C. tenuiflora* was from a greenhouse plant, while *C. grandiflora* is from native material. I cannot determine whether cultivation (and, specifically, greenhouse conditions) could create the differences seen in these specimens. *Coccoloba grandiflora* has more conspicuous ocreolae which are membranaceous, split longitudinally and flaring. In all other characteristics the species are similar. Both species are known only from flowering material.

Brazil. MINAS GERAES: *Glaziou 20439* (B, LE, NY). RIO DE JANEIRO: NUOVO Freiburg, *Glaziou 14217* (C-lectotype, B, K, LE, US).

Coccoloba grandis Benth in Hooker, London Jour. Bot. 4: 624. 1845.

This species is based on *Schomburgk 825* collected on the Rio Branco,

British Guiana. Lindau placed the species in the synonymy of *Coccoloba latifolia* Lam. After having examined the type in the British Museum, I agree with this placement.

Coccoloba guaranitica Hassler, Repert. Sp. Nov. 14: 161. 1915.

Coccoloba guaranitica var. *opaca* Hassler, *ibid.* 162.

Hassler compared his new species with *Coccoloba schomburgkii*, but on the basis of the few specimens I have seen, it seems more nearly comparable to *C. padiformis* from Venezuela, although the leaves of *C. guaranitica* are smaller and more rounded at either end. The fruits of both species are known only from immature specimens, but in both the perianth lobes are conspicuous, imbricate and appear to surround only the upper half of the achene.

Hassler did not select a type in the original description in which he mentioned two collections, *Fiebrig 1429* and *1440*. I have not seen the latter, but the former is a shoot of vigorous and rapid growth.

The variety which Hassler described differs from the species in having smaller leaves, the margins of which are undulate-crenate. It also has a shorter inflorescence. The type of the variety, *Fiebrig 4305*, is a mature shoot system with many lateral flowering branches. It seems quite apparent that the specific name has been applied to younger and more vigorous specimens and that of the variety to the more mature branching specimens and thus the variety is not worthy of recognition.

A specimen of *Fiebrig 4305*, the type of *C. guaranitica* var. *opaca*, was studied by Gross and annotated with both a specific name honoring Fiebrig and a varietal name referring to the crisp leaf margin. Neither name has been published, to my knowledge, although Gross published other epithets in the genus in small notes, often in obscure publications.

Paraguay. Boquerón, Puerto Casado, *Pedersen 4043* (A, C); Chaco, *Fiebrig 1429* (M-isotype); between Río Apa and Río Aquidabán, *Fiebrig 4305* (type collection of *C. guaranitica* var. *opaca*, B, GH, M, P); Bahía Negra, *Rojas 13708* (BR, P, W).

Coccoloba guianensis Meisner, Linnaea 21: 264. 1848.

Several specimens were cited in the original description, but no type was selected. The specimens are obviously the same as the slightly anomalous material described earlier by Bentham as *Coccoloba marginata*. The variation in material called *C. guianensis* and the nomenclature of the complex has been discussed in other papers (Howard, Jour. Arnold Arb. 40: 84, 85. 1959; 41: 45, 46. 1960).

Coccoloba gymnorrhachis Sandwith, Kew Bull. 1932: 221. 1932;
Eyma, Polygonaceae, Guttiferae & Lecythidaceae of Surinam, 111.
1932.

Sandwith based the original description of this species on a flowering

specimen, *Sandwith 168*, from British Guiana. The plant was described as a "bush-rope" and the type shows strong characteristics of a liana. The leaves, broadest above the middle and narrowed to the base, are rigidly coriaceous with the arcuate venation impressed above. The flowers are borne in clusters with tightly appressed ocreolae. Eyma supplemented the original description with a fruiting specimen from Surinam. The Richard collection cited below is also in fruit and is the same as the material which Eyma cited, but these two fruiting collections are not good matches for the type collection and may not belong here. The fruits are warty, as though insect-infested, but no evidence of insect larvae could be found.

Additional collections are needed before the morphological characteristics of *Coccoloba gymnorrhachis* are fully understood and the species clearly defined.

British Guiana. Essequibo River, Moraballi Creek near Bartica, *Sandwith 168* (κ-holotype, NY). **Surinam.** Brownsberg, B.W. 6773 (κ). Location unspecified: L.C. Richard s.n. (P).

Coccoloba ilheensis Weddell, Ann. Sci. Nat. III. 13: 258. 1849.

Coccoloba membranacea Klotzsch, Linnaea 14: 289. 1840, *nomen nudum*.

This is a poorly defined species requiring both field study and many more collections for an accurate interpretation. This species is similar to *Coccoloba glaziovii*, *C. ochreolata* and *C. confusa*. While collections representing the type of each of these species can be distinguished on sight, I cannot find any reliable morphological characteristics useful in separating them in a key.

Brazil. BAHIA: Ilheos, *Martius 1240* (P-holotype, BR, G, GH, LE, M); *Luschnath* s.n. "1839" (LE). Without location: *Luschnath 42* (LE).

Coccoloba japurana Meisner, Fl. Bras. 5(1): 25. 1855.¹

This species is based on a Martius specimen from Ega in the Rio Negro of Brazil. Authentic material is in the Munich herbarium and is represented in the collections of the Gray Herbarium by a photograph. The photograph is a montage of two herbarium sheets and two labels. One label has the hand-written annotations, "*Coccoloba acuminata*" and "*Coccoloba japurana*" and on the same sheet is the annotation, "*Alsodeia japurana* Radlk." One of the sheets has specimens with immature inflorescences. This almost completely overlaps the other sheet from which an infructescence protrudes. The fruit on this axis is clearly not that of a *Coccoloba*.

The name *Alsodeia japurana* Radlk. (Sitz-ber. Math.-Phys. Klasse Akad. München 20: 182. 1891) is recorded in the first supplement of Index Kewensis as an observation. There is no reference to the name *Coccoloba japurana* Meisner in the article cited. However, Lindau at-

¹ ***Rinorea japurana*** (Meisner) Howard, comb. nov. Basionym: *Coccoloba japurana* Meisner in Martius, Fl. Bras. 5(1): 25. 1855.

tributed the transfer to Radlkofer in a list of excluded species and in a footnote in his monograph i.e., "*C. japurana* MEISSN. = *Alsodeia japurana* RADLK." (Bot. Jahrb. 13: 220. 1890).

Alsodeia is a genus of the Violaceae for which most modern writers use the name *Rinorea*. Blake, who monographed the American species of *Rinorea* (Contr. U. S. Natl. Herb. 20: 317. 1924), listed *Alsodeia japurana* as a "doubtful species" with the comment, "This was described from specimens with very young flowers. It is said by Radlkofer to be allied to *A. racemosa*." So many aspects of this misplaced epithet have been overlooked that I have made the new combination in *Rinorea* primarily to place the name in indices for the aid of future workers. An adequate interpretation of the photograph is impossible. Meisner's original description could well be a *Coccoloba*; Lindau saw the material now in the Munich herbarium and would surely have recognized a *Coccoloba* as to genus; Radlkofer worked on *Alsodeia* and would certainly have recognized that genus; Blake did not accept the species, but it is not clear what material he saw or to which description he referred. The fruit in a photograph of a properly labelled specimen, supposedly the type, is not a *Coccoloba*, but appears to be a *Rinorea*. The writer cannot solve the puzzle and may not have placed the specific epithet in its proper niche.

Coccoloba laevis Casaretto, Nov. Stirp. Bras. 71. 1844; Lindau, Bot. Jahrb. 13: 186. fig. 40. 1890.

Coccoloba cordifolia Meisner, Fl. Bras. 5(1): 37. 1855.

Casaretto did not cite a specimen in the original description, but in the same publication he described other species based on his own collections. One sheet, *Casaretto* 2264, in the Turino herbarium, fits the description of *Coccoloba laevis* in all details and should be considered the holotype. I assume that Casaretto unintentionally omitted the citation of a specimen.

In the original description of *Coccoloba cordifolia*, Meisner cited several specimens without selecting a type. He indicated the affinities of his new species with *C. nivea*, *C. cordata*, and *C. candolleana* and cited in synonymy "*Coccoloba uvifera* Salzmann Mss. in Herb. (non Linn.)." In his treatment for the Prodrum (14: 155. 1856) he cited the same specimens, but he did not repeat the suggested synonymy or the possible relationship. Instead he placed his species next to *C. laevis*, which he suggested might be identical with *C. cordifolia* or *C. candolleana*. Lindau was the first to place *C. cordifolia* Meisner in the synonymy of *C. laevis* Casaretto, a decision with which I agree.

The Salzmann collection from Bahia which Meisner cited is represented in several herbaria and the collection at Kew shows the full range of variation from the small-leaved type of Casaretto's species to the broader and more cordate leaved types found in *Blanchet* 3528.

Lindau described and illustrated the fruit of *Coccoloba laevis*, but although I have seen most of the material he cited, I have not found a fruiting specimen, or even a single fruit, among them. If the figure pub-

lished by Lindau can be trusted, the possibility of a hybrid origin of this species should be examined. *Coccoloba marginata* or *C. uvifera* would seem quite likely as parents. At present *C. laevis* is an extremely variable species which is not clearly delineated.

Brazil. BAHIA: Amaralina, San Salvador, *Dahlgren s.n.* (F); Ilha de Cal, *Curran 106* (GH, NY, Y); Itaparica Island, *Casaretto 2264* (TO-holotype); Jacobina, Moritiba, *Blanchet 100* (G, NY), *3528* (G, LE, P). PERNAMBUCO: Pernambuco, *Guillamin s.n.* (F). RIO DE JANEIRO: Rio de Janeiro, *Glaziou 11445* (B, K, P), *Salzmann 476* (G), *s.n.* (K, LE, P). Locality uncertain: Maceio, *Gardner 1391* (K).

Coccoloba lanceolata Lindau ex Glaziou, Bull. Soc. Bot. Fr. IV. 11 (Mem. 3f): 573. 1911, nomen nudum.

The collection *Glaziou 19764* was cited by the author in the original publication with the brief description, "liane, fl. blanchâtres, fruit noir." The specimens seen are obviously from climbing plants. The leaves and infructescence are borne on short lateral shoots. While the epithet has no acceptable standing at the present time, I do not wish either to describe the plant more fully or to place the name in synonymy until further material from southern Brazil is available for study. It is probable that this collection should be assigned to *C. salicifolia*. The leaves of the Glaziou specimen, however, are more lanceolate-oblong in shape, less acuminate at the apex and thicker in texture. The fruits match the illustration given by Lindau for *C. salicifolia*.

Brazil. MINAS GERAES: Riacho das Varas, *Glaziou 19764* (B, C, K).

Coccoloba latifolia Lamarck, Dict. Encycl. 6: 61. *ill. 316, f. 4.* 1804.

Coccoloba grandis Benth in Hooker, London Jour. Bot. 4: 624. 1845.

Lamarck described this species from material cultivated in the Jardin des Plantes, Paris. I have not seen authentic material, but his illustration is of a single detached leaf which does not represent well the species as currently accepted. The description, although somewhat vague, seems applicable, but, since *Coccoloba latifolia* is similar to *C. mollis*, comparable field observations would be helpful. It differs in an almost complete lack of puberulence, in its much stouter and generally hollow stems and in having strongly bullate leaves. I have seen *C. latifolia* in Trinidad where it is a characteristic plant of savanna areas. Its habit is distinctive and this, together with the presence of many biting ants in the large ocreae, makes it long remembered by collectors.

Coccoloba grandis Benth in Hooker is based on *Schomburgk 825*. Lindau placed the species in the synonymy of *C. latifolia*, where it clearly belongs.

Lindau referred three collections by Burchell from São Paulo and Pará to this species. I have seen one sterile sheet of *Burchell 3982* in the herbarium at Kew and feel that this sheet, at least, should be considered the adventitious leaf form of *Coccoloba warmingii* Meisner.

In addition to the localities listed below, the species is also known from Trinidad and its adjacent islands (Jour. Arnold Arb. 40: 81. 1959).

Brazil. CEARÁ: Ceará, *Curran 36* (GH). MARANHÃO: Campo de Boa Esperança, *Froes 1817* (A, NY). **British Guiana.** Mapenna, Courantyne River, *B.G. Forest Dept. 2601* (A); Río Branco, *Schomburgk 825* (BM—type of *C. grandis*). **French Guiana.** Cayenne, savannahs along St. Madeleine Rd., *Broadway 750* (GH, NY); without locality, *Barbier s.n.* (A), *Sagot 486* (A). **Surinam.** Koboerie, *Herb. B.W. 5929* (A); without specific locality, *Hostmann 682* (GH), *s.n.* (BR), *Wullschagel s.n.* (M). **Venezuela.** DELTA AMACURO: Serrania Imataca, N. of Río Guanamo, *Wurdack & Monachino 39724'* (A).

***Coccoloba laurifolia* Jacquin, Hort. Schoenbr. 3: 9. pl. 267. 1798.**

This remains a troublesome name which I cannot place satisfactorily. Meisner recognized the species (DC. Prodr. 14: 165. 1856), noting that the type locality was Caracas, Venezuela, and he cited one specimen (7699) in the Willdenow herbarium. This specimen consists of two sterile shoots obtained from a plant cultivated in a botanic garden and certainly is not the Jacquin type. It is properly referred to *Coccoloba diversifolia* Jacq.

In his monograph (Bot. Jahrb. 13: 158. 1890) Lindau also accepted Jacquin's name and cited two specimens (without known collectors and from Caracas, Venezuela) to be found in the Delessert and Vienna herbaria. Lindau cited many additional collections from Florida, the Bahamas, Cuba, Hispaniola, Puerto Rico and the Virgin Islands. A specimen in the Prodromus herbarium at Geneva which Lindau saw, and the one I believe he cited, was probably collected by Bertero in Hispaniola. The Antillean and Florida material cited by Lindau has been referred to *Coccoloba diversifolia* Jacq.

Although I have suggested that *Coccoloba laurifolia* Jacq. and *C. diversifolia* Jacq. may be the same (Jour. Arnold Arb. 40: 195–196. 1959), I am not entirely convinced of it. A re-examination of all material available to me from Venezuela has failed to reveal any plants which can be compared satisfactorily with the description and illustration supplied by Jacquin. The closest comparison in Venezuela would be with *C. padiformis* Meisner based on the collection *Moritz 377* from Caracas. Material from Central America which I have cited for *C. padiformis* (*loc. cit.* 210–211) and additional collections to be cited in this study are not exactly comparable to Jacquin's description and illustration. These differences at present are primarily in the venation as related to the texture of the leaf blade and in the shape of the leaf apex. A field study of *Coccoloba* plants in the vicinity of Caracas will be necessary to determine what species Jacquin had as a basis for his description and illustration of *C. laurifolia*.

***Coccoloba laxiflora* Lindau, Bot. Jahrb. 13: 191. 1890.**

The holotype in the Berlin herbarium is *Glaziou 11444* from Rio de

Janeiro, Brazil. This species is to be referred to the synonymy of *Coccoloba ramosissima* Weddell.

Coccoloba lehmannii Lindau, Bot. Jahrb. 29(Beibl. 49): 7. 1895;
Howard, Jour. Arnold Arb. 40: 200. 1959.

Coccoloba lehmanni Lindau, Repert. Sp. Nov. 1: 156. 1905.

Coccoloba williamsii Standley, Publ. Field Mus. Bot. 11: 148. 1936.

This species has been discussed in an earlier paper in which its range was extended to Central America and additional species from that area placed in its synonymy. The selection of a lectotype was also discussed at that time. Another similar species is *Coccoloba lepidota* A. C. Smith (*q.v.*). Additional material may show that this, too, should be placed in synonymy here. Two collections from Peru, *Tessman* 3896 and 5258 from Iquitos along the Amazon have been tentatively referred to this species. Several herbarium specimens have been seen of a collection made in 1871 from a cultivated plant in the Calcutta Botanic Garden. No collector or data are given on the sheets, which have carried the name "*Coccoloba excoriata*." These are clearly to be referred to the present species.

Colombia. ANTIOQUIA: Villa Arteaga, *Lopez & Sanchez* 40 (US); Cauca, *Lehmann* 7560 (B-lectotype). META: Puerto López, *E.L. & R.R. Little* 8294 (NY). **Venezuela.** ANZOATEGUI: NE. of Bergantín, *Steyermark* 61217 (F); BARINAS: Barinitas, *Aristeguieta* 1702 (US). MÉRIDA: Between Hacienda Agua Blanca, above La Azulita and Río Capaz, *Steyermark* 56127 (F).

Coccoloba lepidota A. C. Smith, Brittonia 2: 150. 1936.

This species was distinguished by Smith by the "characteristic scales of the petioles and young stem parts." Smith compared *Coccoloba lepidota* with *C. ovata*, which is clearly distinct. The separation of *C. lepidota* and *C. lehmannii* is more difficult and additional material may show that *C. lepidota* should be another synonym of that species. The lectotype of *C. lehmannii*, *Lehmann* 7560 (B), has shorter, more elliptic leaves and a predominance of simple pubescence. *Coccoloba lepidota*, as represented by the type collection, *Krukoff* 5660, has larger obovate-oblong leaves, broadest above the middle and tapering to an obtuse or truncate base. The young stems, petioles and ocreae are covered with lepidote scales and bear lesser amounts of simple hairs and resinous excretions. A tendency towards this development is found in the type collection of *C. lehmannii* and in the other collections cited below. It is probable that *C. lepidota* is an extreme variation of *C. lehmannii*.

Brazil. ACRE: Near mouth of Rio Macauhan, *Krukoff* 5660 (NY-holotype, A, LE, M, W), 5659 (A, LE, M, NY).

Coccoloba leptostachya Bentham, Bot. Sulph. 59. 1856; Meisner, DC. Prodr. 14: 163. 1856.

As has been pointed out in an earlier paper in this series (Jour. Arnold

Arb. 40: 188. 1959), Bentham described this species, citing the type locality as "Libertad in Colombia." The type is a Barclay specimen at Kew. I have studied this and have concluded that the specimen was collected in Central America. Recent collections from Libertad in El Salvador proved to match the Barclay collection well. I have seen no comparable material from Colombia. *Coccoloba leptostachya* Bentham is referred to the synonymy of *C. barbadensis* Jacquin (1760), which is known from Mexico, Guatemala and El Salvador. The species need no longer be considered in the South American flora.

Coccoloba longependula Martius ex Meisner, Fl. Bras. 5(1): 27. *pl.* 9. 1855; Lindau, Bot. Jahrb. 13: 177. 1890.

After an examination of the type of this species (*Martius* 759 from Minas Geraes, Brazil [M]), this has been referred to the synonymy of *Coccoloba sticticaulis* Weddell (*q.v.*).

Coccoloba longiochreata Hassler, Repert. Sp. Nov. 14: 162. 1915.

This species is clearly the same as *Coccoloba cujabensis* (*q.v.*) and has been referred to synonymy there. Hassler cited two collections, *Fiebrig* 1284 and 1443, in his own herbarium. The collections were made in the Gran Chaco at Puerto Talavera, Paraguay.

Coccoloba longipes S. Moore, Trans. Linn. Soc. II. 4: 446. 1895.

Coccolobis padifolia Rusby, Mem. N. Y. Bot. Gard. 7: 235. 1927.

In the original description Moore compared his new species with *Coccoloba laxiflora* Lindau, which I now regard as the same as *C. ramosissima* Weddell. There is a striking similarity between these two species in the delicate inflorescences and the long peduncles. There are differences in the leaf size which should be re-examined when additional materials become available from southern Brazil. At present I distinguish *C. longipes* by the ovate-oblong leaf blades which taper from the middle to a blunt apex. *Coccolobis padifolia* Rusby was described without any comparison of other species. A study of the type collection indicates that it should be placed in the synonymy of *C. longipes*.

Bolivia. Rurrenabaque, *Rusby, Mulford Ex. No. 848* (NY-holotype of *C. padifolia*, GH). **Brazil.** Matto Grosso, *S. Moore 577* (BM-holotype, B, NY).

Coccoloba lucidula Bentham in Hooker, London Jour. Bot. 4: 627. 1845.

Coccoloba sagotii Lindau, Bot. Jahrb. 13: 184. 1890.

The two species treated here fall into widely separated portions of Lindau's monographic treatment of *Coccoloba*, yet it seems clear to the writer that they are identical. *Coccoloba lucidula* was based on flowering

specimens with delicate, membranaceous, immature leaves which crinkled in drying, turned black and became lustrous on the upper surface. Benthams cited only one specimen collected by Schomburgk, "2nd Coll. 947 (1262)." The species has not been collected again and no modern collections have been assigned to it. The mature foliage and fruiting specimens of *C. sagotii* would appear to belong in synonymy here, but since at present there is no comparable material for *C. lucidula*, there is need for additional mature specimens of the latter.

Coccoloba lucidula is described as a woody vine by collectors of the specimens cited below. *Perrottet* 1820 (P) is a delicate vine tapering to a tenuous apex. On this specimen the immature condition of the leaves is clearly shown, from minute to fully expanded, though membranaceous, forms. Many of the mature leaves of other collections are folded, indicating that when fresh the midrib is sharply curved downward. The fruit is distinctive, being nearly spherical and smooth. A small stalk is distinguishable at the base of the fruit and the apex is more or less obtuse, with very small, imbricate perianth lobes. *Perrottet* 83 from British Guiana which is referred here was cited by Lindau (*loc. cit.* 168) as *Coccoloba racemulosa* and, thus identified, was an important example of his Guiana-northern Brazil distribution (*loc. cit.* 116).

Coccoloba sagotii was described by Lindau and was based on an unnumbered Sagot collection from "Guyana gallica" near Cayenne. This is a fully matured branch of scrambling habit. The infructescence is old but fruits have been preserved. The leaves are coriaceous and shiny above. Lindau distinguished this species from *C. lucidula* by the glabrous branchlets and infructescence rachis, but close examination shows that in all reliable characteristics the type collections are similar. The pubescence present on material of *C. sagotii* was overlooked by Lindau. Lindau also referred to specimens in the herbaria at Berlin and Stockholm, but both of these are merely fragments. The most complete specimen of this collection is in the Paris herbarium.

British Guiana. Coverden, *Persaud* 136 (F, K, NY); Demerara River, *Jenman* 6309 (K); Ituni, south of Mackenzie, *Cowan* 39255 (K, NY); Roraima, *Schomburgk* 947 (1262) (K-type collection, BR). Without specific location: *Perrottet* 83 (G), *s.n.* (P); *Schomburgk* 81 (B). **French Guiana.** CAYENNE: *Martin s.n.* (K), *Poiteau s.n.* (K), *L.C. Richard s.n.* (P), *Sagot s.n.* (type collection of *C. sagotii*, B, P, S), *Talbot s.n.* (K); Montagne de Kaw, *Cowan* 38798 (NY). **Venezuela.** Bolívar, Tumeremo, *Steyermark* 60942 (F).

Coccoloba marginata Benthams, in Hooker, London Jour. Bot. 4: 626. 1845.

Coccoloba guianensis Meisner, Linnaea 21: 264. 1848.

Coccoloba martii Meisner, Fl. Bras. 5(1): 37. 1855.

Coccoloba martii var. *major* Meisner, *ibid.* 38.

Coccoloba martii var. *minor* Meisner, *ibid.*

Coccoloba nitida var. *cordata* Meisner, *ibid.*

Coccoloba nitida var. *rotundata* Meisner, *ibid.*

Coccoloba trinitatis Lindau, Bot. Jahrb. 13: 182. 1890.

Coccoloba douradensis Glaziou, Bull. Soc. Bot. Fr. IV. 11(Mem. 3f): 571. 1911 (provisional name with mixed type; see also *C. densifrons*).

A discussion of this species is given in two earlier papers (Jour. Arnold Arb. 40: 84–85. 1959, and 41: 45–46. 1960). I have seen additional material (cited below) which extends the range of this species to Venezuela and possibly to the Brazilian states of Minas Geraes, Goyas, Bahia, Acre and Santa Catarina. Additional field study is needed to determine the variations in individual plants as these occur in South America.

While I am following Lindau in considering *Coccoloba martii* a synonym of *C. marginata*, I wish to point out the possibility that *C. martii* more properly may be assigned to *C. peltata* Schott. Certainly the Salzmann collections from Bahia previously identified as "*C. pendula*" or *C. nitida* var. *cordata* are intermediate between material of *C. peltata* from Rio de Janeiro and material of *C. marginata* from the Guianas. At present *Coccoloba peltata* may be represented only by anomalous material and therefore the species may be incorrectly interpreted.

Brazil. ACRE: Rio Macauhan, *Krukoff* 5479 (G, K, M, NY, W). AMAZONAS: São Paulo de Olivença, *Krukoff* 9048 (F, K, NY); without specific locality, *Ule* 9347 (G, K). BAHIA: Chapada do Rio das Femmeas, Carrasco, Ilheos, *Riedel* 244 (LE, P), *Blanchet* 3049 (LE); *Lützelburg* 516 (M); without specific locality, *Salzmann* 475 (P). GOYAS: Chapada do Rio Preto, *Lützelburg* 1304 (M); Patavidade, *Macedo* 3.859 (K); without specific locality, *Burchell* 7768 (P). MINAS GERAES: Caraca, *Tavares* 316 (M). **British Guiana.** Kaieteur Plateau, *Maguire & Fanshawe* 23316 (A, NY); Kaieteur Savannah, Potaro River, *Jenmann* 831 (K); basin of Kuyuwini River, *A.C. Smith* 3030 (A); Waini River, *De la Cruz* 3712 (GH); without locality, *Poiteau* 179 (LE). **Dutch Guiana.** Paramaribo, *Kappler* 1620 (P), *Wullschlagel* 882 (BR); without specific locality, *Hostmann* 506 (P), *Wullschlagel* 992 (BR). **French Guiana.** Cayenne, *Broadway* 307 (GH); without specific locality, *Leprieur* 187 (A), *Lequillon* s.n. (P), *Melinon* 252 (A). **Venezuela.** AMAZONAS: Tamatama, Upper Orinoco, *Llewelyn Williams* 15233 (F); without specific locality, *Gines* 5105 (US). BOLIVAR: Raudal Guaiquinima, *Cardona* 474 (US), 475 (US), *Maguire* 33134 (A, NY).

Coccoloba martii Meisner, Fl. Bras. 5(1): 37. 1855.

Coccoloba martii var. *major* Meisner, *ibid.* 38. 1855.

Coccoloba martii var. *minor* Meisner, *ibid.*

No type had been selected, but the species was considered to consist of its two varieties. An examination of the material cited led to the conclusion that these taxa may be referred to the synonymy of *Coccoloba marginata* Benth. There is a possibility, as was pointed out in the discussion of *C. marginata*, that *C. martii* and *C. peltata* are the same.

Coccoloba meissneriana (Britton) K. Schum. in Just, Bot. Jahresber. 28(1): 451. 1902.

Uvifera meissneriana Britton in Rusby, Bull. Torrey Club 27: 129. 1900.

This species is known from but two collections from the same area. It is similar to *Coccoloba peruviana* and eventually both may be included in *C. obtusifolia* (q.v.). At present it can be distinguished by the tomentum on the young stems and petioles, on the entire lower leaf surface and on the midrib of the upper leaf surface. The inflorescence is copiously pubescent, as well. The fruits are comparable to those of *C. obtusifolia*, having the achene surrounded by the imbricated lobes of the perianth. The Rusby collection is from a staminate plant and was in flower in May. The Bang collection, made in July, is in fruit.

Bolivia. Guanai, *Rusby 1918* (NY—holotype, B, GH), *Bang 1595* (A, GH, K, LE, M, NY).

Coccoloba membranacea Klotzsch, *Linnaea* 14: 289. 1840.

This species is apparently based on a Luschnath collection from Bahia, Brazil. The original description is brief, "Arborescens, floribus lutescenti-viridibus." Lindau (*Bot. Jahrb.* 13: 165. 1890) regarded the original epithet as a *nomen nudum* and referred it to the synonymy of *Coccoloba ilheensis*. At that time he cited "*Luschnath 42*," a specimen of which is in the Leningrad herbarium. I have seen that sheet, but there is no annotation to indicate that it is the type of *C. membranacea*. The specimen is properly referred to *C. ilheensis*.

Coccoloba microneura Meisner, DC. *Prodr.* 14: 163. 1856; Howard, *Jour. Arnold Arb.* 41: 42. 1960.

This species has been discussed in the earlier paper cited above and referred to the synonymy of *Coccoloba nitida* HBK. The type was *Purdie s.n.*, collected in the vicinity of Santa Marta, Colombia. Meisner reported the type specimen to be in the Arnott herbarium, but such a specimen cannot be found, although there is a specimen in the herbarium of the Royal Botanic Garden at Kew.

Coccoloba microphylla Morong in Morong & Britton, *Enum. Pl. Coll. Parag.* 212. 1892; *Ann. N. Y. Acad.* 7: 213. 1893, not Griseb. 1866.

This species was based on *Morong 899*, made along the Río Pilcomayo in Paraguay. Because the epithet is a later homonym of *Coccoloba microphylla* Grisebach, Hassler renamed it *C. morongii*. An examination of the type collections shows that it should be referred to the synonymy of *C. paraguariensis* Lindau.

Coccoloba micropunctata Eyma, *Meded. Bot. Mus. Utrecht* 4: 1. 1932.

I am unable to accept Eyma's criteria for distinguishing the material he cited as a species distinct from *Coccoloba excelsa* (q.v.), and so have referred his species to synonymy there. The type selected was *Stahel 77* from Dutch Guiana.

Coccoloba mollis Casaretto, Nov. Stirp. Bras. 72. 1844.

Coccoloba polystachya Weddell, Ann. Sci. Nat. III. 13: 261. 1850.

Coccoloba paniculata Meisner, Fl. Bras. 5(1): 43. pls. 20, 21. 1855.

Coccoloba polystachya var. *mollis* Meisner, DC. Prodr. 14: 151. 1856.

Coccoloba polystachya var. *glabra* Lindau, Bot. Jahrb. 13: 133. 1890.

Coccoloba polystachya var. *pubescens* Lindau, *ibid.*

Casaretto cited no collection by number or name of collector in the original publication, so one must assume that he was referring to his own collection. Such a specimen, now in the Turino herbarium, was made on the island of Itaparica, near Bahia, Brazil, and the data on the label agrees in description and location with that published by Casaretto. The label on the specimen also stated the number of the collection as 2218 and the catalogue number as 80. Lindau cited "*Casaretto 2218*" and "*Meisner 80*." These are one and the same sheet. This single sheet in the Turino herbarium, the holotype of this species, is a sterile specimen in poor condition consisting of two leafless twigs and five detached leaves, probably coming from an adventitious shoot since one twig is extremely pubescent. The conspicuous development of the pubescence can be matched on the collection *Lützelburg 295* in the Munich herbarium. The label states that this collection came from a tree 6 meters tall; however, the very large leaves, long internodes and copious pubescence all suggest abnormal or adventitious growth. Other flowering collections by Lützelburg cited below from the state of Ceará appear to be transitional in pubescence, size and shape of leaves and length of internodes.

Weddell described *Coccoloba polystachya*, being unaware of Casaretto's name. He saw a living specimen which was given a catalogue number, and he also cited the collection "*Martius 1242*." No specimens of the living plant appear to have been preserved, so the Martius collection may be taken as the type of *C. polystachya*. The specimens I have seen of *Martius 1242* bear female flowers and a sheet from Leningrad has the fragment of a sterile shoot, but there is no doubt that the Leningrad collection is the same as the more pubescent type of *C. mollis* Casaretto.

In 1855 in the *Flora Brasiliensis* Meisner published a treatment of the genus *Coccoloba*. He accepted *C. polystachya* Weddell and referred *C. mollis* Casaretto to the synonymy of Weddell's species, with a question. He cited specimens collected by Salzmann, Spruce and Weddell. The illustration given for this species is of a staminate plant and does not represent the type of either *C. mollis* or *C. polystachya*.

At the same time Meisner described a new species, *Coccoloba paniculata*, illustrated in two plates by staminate and pistillate plants. He cited an unnumbered collection by Pohl, the collection *Poeppig 2649*, and also *Martius 1242*, which Weddell had cited in the original description of *C. polystachya*. Meisner distinguished between *C. polystachya* and *C. paniculata* by the more abundant pubescence of the former.

In 1856 Meisner repeated for the *Prodromus* the description of the two species and, in addition, listed *Coccoloba polystachya* var. *mollis*, based

only on *C. mollis* Casaretto and the collection "Casaretto 80." It is of interest to note that Meisner cited *Martius 1242* under both species, but indicated (with an exclamation point) only the citation of this collection as *C. polystachya*.

In 1890 Lindau recognized *Coccoloba polystachya*, with two varieties. *Coccoloba polystachya* var. *glabra* Lindau is based on *C. paniculata* Meisner, while *C. polystachya* var. *pubescens* Lindau is based on *C. mollis* Casaretto. Lindau noted that the varieties were based on the amount of pubescence and that intermediates were to be found.

Eyma (Meded. Bot. Mus. Utrecht 4: 4. 1932) recognized that the oldest name was *Coccoloba mollis* Casaretto and accepted this, including with it *C. polystachya* Weddell and *C. polystachya* var. *pubescens* Lindau. Eyma did not treat *C. paniculata* Meisner or *C. polystachya* var. *glabra*, thus implying his acceptance of them. Macbride's treatment of the genus for the Flora of Peru (Publ. Field Mus. Bot. 13: 460. 1937) appears to be based on the work of Eyma, although no reference is given. I have seen only a few of the specimens cited by Eyma. In general the specimens from French and Dutch Guiana have a different aspect in the texture of the leaves and the color of the pubescence. Moreover, the petioles and branches of the inflorescence tend to be longer. The plants from this area may represent a geographic race, or perhaps even a distinct species. Additional material is needed for an understanding of the conditions seen in these plants.

One collection of Krukoff from the Basin of the Rio Solimoes, also, is difficult to fit into the general pattern of *Coccoloba mollis*. This collection, *Krukoff 8841*, has leaves of still different texture and in this case the branches of the inflorescence are short, resembling those of *Coccoloba dugandiana*. The collection is in fruit and the samples opened, all sterile and hollow, are strongly triangular in outline and section. The lobes of the perianth are appressed against the apex, rather than coronate, as in the few fruits seen of typical *Coccoloba mollis*. At present the collection does not merit description as a new species.

I have not accepted the glabrous variety created by Lindau, since additional field study of this species is needed to understand the variation in pubescence with the age and habit of the plant. The species seems clearly dioecious, the pistillate plants appearing to be more pubescent than the staminate plants. Collections made from the coastal areas are also more pubescent than those from inland stations in South America. The shape of the leaf, particularly the base, and the length of the petiole are extremely variable in the specimens cited. The species is easily recognized, since so few species of *Coccoloba* have paniculate inflorescences; however, no existing description is adequate. I sincerely hope that some botanist in an area where this plant grows can make the necessary study of variations in *C. mollis*.

Bolivia. SANTA CRUZ: Sara, Bosques de Buenavista, *Steinbach 6563* (A). Without specific locality: Yungas, *Bang 299* (G, GH, K, LE, M, NY).

Brazil. ACRE: Rio Macauhan, *Krukoff* 5550 (A, M, NY); Seringoel Auristella, *Ule* 9346 (G, K). AMAZONAS: Ega, *Poeppig* 2649 (B, LE); São Paulo de Olivença, Palmares, *Krukoff* 8314, 8337 (A, BR, LE, NY), 8841 (A, BR, NY); Humayta near Tres Casas, *Krukoff* 5550 (A, M, NY). BAHIA: Camapuan, *Riedel* 628 (A, LE); Itaparica, *Casaretto* s.n. (to-holotype); São Bento das Lages *Lützelburg* 295 (M). CEARÁ: Barxa d'Anta, *Lützelburg* 26278 (M); Grangeiro, *Lützelburg* 25800 (M, W), 25838 (M); Soure, *Drouet* 2377 (GH); without specific locality, *Gardner* 1828 (NY). GOYAZ: Rio dos Alnas, *Glaziov* 21980 (A, LE); Tocantinópolis, *Pires & Black* 1650a (US); without specific locality, *Burchell* 7351-2 (GH). MARANHÃO: Loreto, *Snethlage* 656 (F); Maracassumé River, *Froes* 1811 (A, NY). MATTO GROSSO: Cuyabá, *Martius* 1242 (M-holotype of *C. polystachya*, BR, LE, NY). MINAS GERAES: Paracatu, *Riedel* s.n. (LE). PARÁ: Barra do Rio Negro, *Spruce* s.n. (Oct. 1850) (B, GH, LE, M, NY); Cassipa, Tapajos River region, *Krukoff* 1246 (A, NY). PERNAMBUCO: Tapera, *Pickel* 2483 (GH). PIAUHY: Urussuhy, *Snethlage* 633 (F). RIO DE JANEIRO: Without specific locality, *Burchell* 5912 (GH). Locality not specified: *Pohl* s.n. (BR, M, NY). **Dutch Guiana.** Bradilifi, Matoela, *Stahel* 189 (A); Zanderij I., *Herb. Surinam* 189 (NY), 4903 (A, NY). **Ecuador, MANABI:** El Recreo, Balao, *Eggers* 14497 (A, B, LE, M), 15675 (GH, K, LE, M, NY). **French Guiana.** Godebert, *Wachenheim* s.n. (A); without locality, *Melinon* 106 (A). **Peru.** LORETO: Florída, Río Putumayo at mouth of Río Zubineta, *Klug* 1991 (A, GH, NY); Río Santiago, *Tessmann* 4372 (NY); Middle Ucayale, *Tessmann* 3195 (NY).

Coccoloba monoica Ruiz ex Meisner, DC. Prodr. 14: 149. 1856.

Meisner cited this name in synonymy as "*Coccoloba monoica* fl. peruv. Ruiz" and recorded seeing a specimen in the Berlin herbarium. Lindau (Bot. Jahrb. 13: 220. 1890) apparently saw the authentic material, since he referred the epithet to synonymy under *Muhlenbeckia tamnifolia* var. *laxiflora* Meisner. The type specimen was not located during a brief search in the Berlin herbarium several years ago.

Coccoloba morongii Hassler, Repert. Sp. Nov. 14: 162. 1915.

This was a new name, provided by Hassler for *Coccoloba microphylla* Morong (1893), not *C. microphylla* Griseb. (1866). The species is to be placed in the synonymy of *C. paraguariensis* Lindau.

Coccoloba moritziana Klotzsch ex Meisner, Fl. Bras. 5(1): 28. 1955.

Meisner published this epithet in the synonymy of his new *Coccoloba moritzii* var. *opaca* and reported that he found the manuscript name in the Berlin herbarium. I have not been able to locate such a specimen, although Lindau (Bot. Jahrb. 13: 216. 1890) referred the name to the synonymy of *C. ovata*.

Coccoloba moritzii Meisner, Fl. Bras. 5(1): 28. 1855.

Coccoloba moritzii var. *opaca* Meisner, *ibid.*

Coccoloba moritzii var. *lucida* Meisner, *ibid.*

Lindau (Bot. Jahrb. 13: 216. 1890) has referred this species and its

varieties to the synonymy of *Coccoloba ovata*. The difficulty in typifying these names will be discussed under *C. ovata*. On the basis of the material I have seen, I believe Lindau's action to be correct. In the original publication Meisner attributed the name *Coccoloba moritzii* to Klotzsch and cited in the synonymy of *C. moritzii* var. *opaca* the manuscript name *Coccoloba moritziana* which he found in the Berlin herbarium. I have not been able to find the name published in any of Klotzsch's writings.

Coccoloba mosenii Lindau, Bot. Jahrb. 13: 173. 1890, "*Moseni*."

Coccoloba fastigiata var. *glabrata* Meisner, Fl. Bras. 5(1): 34. 1855.

This species represents a climbing plant with the leaves borne on short lateral branches. The leaf blades have a characteristic shape, oblong-obovate to nearly lanceolate-obovate. The range of variation in habit, as well as in shape of leaf cannot be determined from the few specimens on hand. Additional material is needed for further study. The basis for the proper assignment of *Coccoloba fastigiata* var. *glabrata* to synonymy here has been discussed under that epithet.

Brazil. SÃO PAULO. Santos Lorosocaba, *Mosen* 3458 (s-lectotype, B, G, P), *Loefgren* 10432 (M). Without definite locality, *Burchell* 3844 (P).

Coccoloba nigra Fawcett & Rendle, Jour. Bot. 51: 123. 1913; Fl. Jamaica 3: 120. 1914; Howard, Jour. Arnold Arb. 38: 106. 1957.

As I have discussed in an earlier paper, Fawcett and Rendle based this species on a collection annotated "Jamaica," but without the collector's name or number. The type in the Edinburgh herbarium has been studied, and it is certainly a fragment of *Schomburgk* 531, the type of *Coccoloba ovata*, from British Guiana. A specimen of the Schomburgk collection is also in the Edinburgh herbarium and the two sheets match, even to the lichens on the branches. The name *Coccoloba nigra* must therefore be assigned to the synonymy of *C. ovata* Benth.

Coccoloba nitida HBK. Nov. Gen. 2: 176. 1818.

Coccoloba microneura Meisner, DC. Prodr. 14: 163. 1856.

In the eighth paper of this series (Jour. Arnold Arb. 41: 41–42. 1960), I corrected an earlier mistake and correctly defined *Coccoloba nitida* as a species currently known only from Colombia. A lectotype (*Humboldt* 1627) was designated in the Paris herbarium. It was collected at San Bartholome on the Río Magdalena.

Coccoloba microneura is clearly the same species and was described from the Purdie collection, without number, from Santa Marta, Colombia.

Coccoloba nivea Jacquin, Hist. Stirp. Am. 115. pl. 78. 1763.

Several modern writers on South American vegetation have used this

epithet without citing specimens which can be identified. *Coccoloba nivea* Jacq. is a synonym of *C. venosa* L. (1759), and specimens from South America will be cited under that name. Schomburgk referred to *Coccoloba nivea* under cultivation in his *Flora and Fauna of British Guiana*.

Coccoloba novogranatensis Lindau, Bot. Jahrb. 13: 192. 1890; Howard, Jour. Arnold Arb. 41: 40. 1960.

I have referred this species to the synonymy of *Coccoloba coronata* Jacq. (*q.v.*). In an earlier paper (Jour. Arnold Arb. 40: 85–86. 1959) I selected as a lectotype one sheet of the collection *Triana 978* in the herbarium of the Muséum d'Histoire Naturelle, Paris. The Triana collection was made between Anapoima and Apulo, Prov. Bogotá, Colombia.

Coccoloba nutans HBK. Nov. Gen. 2: 175. 1818.

Authentic material of this species indicates that the specific name was proposed by Kunth. The original description is brief and reflects the inadequate and immature condition of the specimens. Ocreae are not present on the stems and the inflorescence, described as nutant, is immature or abortive. Meisner (DC. Prodr. 14: 155. 1856.) repeated the original description, with minor changes, and reported, "Species non satis nota, nec in herb. Kunth, nec in Willdenowiano extans." Lindau attributed the collection to Bonpland and cited from the Berlin herbarium a specimen which consists of one detached leaf and the fragment of an inflorescence 2 cm. in length. These fragments were obtained from the Paris herbarium. I have been able to examine the original collection in Paris which is, in turn, from the Bonpland herbarium. It currently consists of a short stem, without ocreae, and is broken at both ends. A single recurved lateral inflorescence having very immature flower buds is present. Poor though it is, this collection must be designated as the holotype.

No recent collections have been assigned to this species. Macbride, who treated the genus for the Flora of Peru, saw no material. However, I believe that two of the collections he cited under *Coccoloba sphaerococca* are more properly placed in the present species. A collection, *Killip and Smith 29027* (NY), made at Yurimaguas on the lower Río Huallaga, Dept. Loreto, Peru, consists of the stem and leaves of a woody vine. One detached leaf is comparable to that of the Bonpland collection. Additional smaller leaves are present, but resemble the leaves of *Coccoloba ascendens*. Although Kunth did not record the height or habit of *Coccoloba nutans* in the original description, Meisner, Lindau and Macbride have referred to the plant as a tree. I believe that they are in error and that *Coccoloba nutans* is a woody vine usually with coriaceous, elliptical leaves rounded at the base, but that occasionally on vigorous shoots the oblong-obovate leaves with subcordate bases are produced. The species is similar to *Coccoloba ascendens*, but additional material is required for a proper understanding of the species.

*Killip and Smith 27958 and 29027 and that of Llewelyn Williams 3805, assigned in various herbaria to *Coccoloba peltata* Schott and *Coccoloba sphaerocarpa* Lindau, appear to be *C. nutans*.*

Coccoloba nymphaeifolia Schenk in Zittel, Handb. Palaeont. 2: 491. 1887; Lindau, Bot. Jahrb. 13: 181. 1890.

Schenk used the name *Coccoloba nymphaeifolia* in comparing fossil leaf material to living species. At that time a plant called *Coccoloba nymphaeifolia* was under cultivation in the Leipzig botanical garden. A single leaf is preserved in the Berlin herbarium and bears the annotation, "*Coccoloba nymphaeifolia* de Jonge, H. Lips. Brazil." Lindau correctly referred this specimen and name to the synonymy of *C. peltata* Schott. The epithet *C. nymphaeifolia* is a *nomen nudum*.

[*To be concluded*]